LATE RESIDENCE OF HENRY SHAW, IN THE GARDEN.

Henry Shaw

From a Painting by Fairchild and Fox about 1887.

THE

MISSOURI BOTANICAL

GARDEN.

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* *Ex-officio.*

[1] Elected April 9th, 1890, to fill the vacancy caused by the resignation of Judge Samuel Treat, one of the Trustees named by Mr. Shaw.

[2] Elected December 18th, 1889, to fill the vacancy caused by the resignation of M. Dwight Collier, one of the Trustees named by Mr. Shaw, but who had removed from the City.

[3] Elected President of the School Board November 12th, 1889, in place of F. N. Judson, who met with the Board until that date; succeeded by Dr. Hugo Auler from March 11th to May 20th, 1890, at which time he was re-elected and has since met with the Board.

PREFACE.

Provision is made in the will of the late Henry Shaw for an annual banquet to the Trustees of the Botanical Garden established by him, and to their guests invited for that occasion. The purpose of this provision is evidently to acquaint those who may be benefited by or who may further the usefulness of the Garden, with its scope and equipment. To attain this end so far as may be, and to furnish similar information concerning the School of Botany established by Mr. Shaw under the charter of Washington University but in intimate relation with the Missouri Botanical Garden, the Board of Trustees of the Garden have requested the Director, in consultation with the Garden Committee, to prepare and publish on behalf of the Board, a suitable volume containing a short biographical sketch of Mr. Shaw; the Act of the General Assembly of Missouri authorizing the creation of a Trust for the management of the Garden; the last Will of Henry Shaw, made in pursuance of this Act; the Deed of Endowment of the School of Botany; the report of the inaugural exercises of the School, including the address of the Professor in charge; the report submitted to the Directors of Washington University, on the work accomplished by the School of Botany during the first five years of its existence; the first annual report of the Director of the Garden, for the year 1889; the first annual flower sermon, preached in Christ Church Cathedral on the 18th of May,

1890, under the provisions of the will of Mr. Shaw, by the Bishop of Missouri; and the proceedings at the first annual banquet, given at the Southern Hotel by the Trustees on the 26th of May, 1890.

In compliance with this request, the following pages have been prepared, as containing authentic information concerning the objects of the Garden and School of Botany, and the principal steps which have thus far been taken to forward them. It is a pleasure to record here my obligation to Mr. Thomas Dimmock for preparing the excellent biographical sketch of Mr. Shaw which forms the opening paper, and to Mr. Henry Hitchcock, Chairman of the Garden Committee, for a large part of the work involved in collecting and editing the facts contained in the remainder of the book.

WILLIAM TRELEASE.

ST. LOUIS, July 5, 1890.

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HENRY SHAW.

A BIOGRAPHICAL SKETCH BY THOMAS DIMMOCK.

Like most of the world's benefactors, Henry Shaw has left scanty material for the biographer. A life prolonged far beyond the ordinary term, and full of active effort almost from beginning to end, was singularly uneventful — "Keeping the noiseless tenor of its way" from birth to death with little to break, nothing to seriously disturb, its even current. He was a public man only through his labors for the public good. He held no office of any kind, was never a prominent figure in state or municipal affairs, and by choice as well as natural temperament was essentially a private citizen. Even when his benefactions had made him famous abroad as well as at home, he remained the same modest and retiring gentleman; seeking no honor, caring for no praise — anxious only that his works should live and speak for him when he had gone. And his life was so completely identified and blended with these works, that they will ever be the best and all-sufficient biography of him.

Henry Shaw was born in Sheffield, England, July 24, 1800. His father, Joseph Shaw, was a native of Leicester, but removed to Sheffield at a very early age. The mother, Sarah Hoole, whom he most resembled in disposition, was a native of that city. Henry was the oldest of four children. One son died in infancy, and two daughters are still living: Miss Sarah Shaw, in Rochester, New York, at the age of 86, and Mrs. Caroline Morisse, in St. Louis, at the age of 84. The father was a manufacturer of grates, fire-irons, etc., and had a large establishment in Green Lane, Sheffield, which was afterwards removed to Roscoe Place; both of which sites have long since disappeared before the advancing tide

of brick and mortar. Probably the earliest recollections of the boy were associated with the factory and warehouse, but he showed no tendency to tread in the paternal footsteps in that respect; though the business habits and methods he was thus brought in contact with at the period when the mind is "wax to receive and marble to retain," were of inestimable service to him at a later day.

His primary education was obtained at Thorne, a village not far from his native town; and his favorite place for study, we are told, was an arbor, half-hidden by blossoming vines and surrounded by trees and flowers. He seems to have been a lover of these from childhood, and with his two sisters passed many happy hours in the little garden attached to the family residence; "planting and cultivating anemones and ranunculus," as he remembered and told after the lapse of nearly eighty years.

From Thorne he was transferred to Mill Hill, about twenty miles from London. It was what is termed in England a "Dissenting" school, the elder Shaw being a Baptist; but was considered among the best private institutions of learning in the Kingdom. Here he remained some six years, leaving probably in 1817; and here he finished that part of his education which schools could give — the education that taught him how to educate himself in the long and busy life upon which he was soon to enter. Mill Hill gave him an average knowledge of the classics, less of Greek than of Latin; and more than an average knowledge of mathematics, which he developed by subsequent study, for the mere love of the science apparently. He was for a long time regarded as the best mathematician in St. Louis. At both schools he was taught French, and became in later years an excellent French scholar; speaking, reading and writing it with as much ease and correctness as English. He was especially fond of French literature, and his library is quite rich in the standard authors as well as lighter works. Undoubtedly, he was introduced at Mill Hill to other modern languages: German, Italian and Spanish — all of which

(except perhaps German) he followed up more or less until the last years of his life; as well-thumbed grammars and dictionaries, and a good selection of Italian and Spanish books, abundantly prove.

With this preliminary equipment the boy took his place in the ranks of men by assisting his father at the home establishment for a year, and then — in 1818 — came with him to Canada. His manly qualities must have shown themselves unmistakably by that time, for the same year his father sent him to New Orleans; mainly, it is understood, with the object of learning the mysteries of cotton-raising, though other business of no great consequence required his presence there. But his stay in Louisiana was short; he did not like the climate, nor were there any present or prospective financial inducements to remain. He was now his own master, and decided to exchange the South for the North and try his fortune in the then small and remote French trading post called St. Louis. Embarking on the "Maid of New Orleans," after a long and tedious voyage the youthful adventurer arrived at his destination May 3, 1819. A venerable citizen — Mr. Frederick L. Billon — saw the steamer come to anchor at the foot of what is now Market Street, and was among the first to welcome the stranger. He says: "Mr. Shaw had come from England with a small stock of cutlery, to make his fortune in the New World. With little means he began business on the second floor of a building which he found for rent, and for a time lived, cooked, and sold his goods in this one room. I have sat with him there many a time, playing chess during the long evenings. He cared little for society, and while he went out to parties and balls occasionally, he seemed to avoid making acquaintances among the girls of that period. The reason of this was [so thinks Mr. Billon] that he had come to make money solely, with the expressed intention of some day returning to his native heath to enjoy the result of his early years of labor. He intended marrying some English girl, and for that reason avoided making female

friends, fearing he might fall in love and thus spoil his well-defined plans."

The capital which bought the "small stock of cutlery" and gave the young man his first start in life, was furnished by his uncle, Mr. James Hoole, who lived to see the splendid success of the perilous investment, and for whose memory his nephew cherished the profoundest respect.

While, very naturally and properly, the main object of Mr. Shaw at this the decisive period of his career was to "make money," and thereby secure that financial independence necessary for the accomplishment of higher purposes, and while in order to do this he willingly denied himself many youthful enjoyments, he did not push his prudent self-denial beyond reasonable limits. Then and always he knew how to harmonize business and pleasure, how to use both without abusing either, and so to obtain the benefits of both with the fewest possible disadvantages. He never believed in the popular American doctrine of "all work and no play," nor did he adopt the equally foolish American idea which postpones the play until work has destroyed all desire for it. He had his time for business and his time for pleasure, and never allowed one to interfere with or encroach upon the other. St. Louis in those days was small in population, but large enough in the material for social enjoyment. The dominant element was French; with all that the name implies in warm hospitality, simple courtesy, fondness for innocent amusement, and that invincible light-heartedness which no care or trouble, however heavy, can altogether subdue. His knowledge of the language was no less useful in social than in commercial affairs, and combined with uniform politeness and entertaining conversation soon made him as much at home in this little fragment of far away France as if he were a Frenchman born. The finest garden in St. Louis then belonged to Madame Rosalie Saugrain; and her daughter — the late Mrs. Henry Von Phul — remembered how the young Englishman, on his daily afternoon horse-back rides

into the open country beyond what is now Seventh Street, would stop at the garden fence, admire the beautiful flowers, and exchange pleasant words with the accomplished lady who had brought the manners and tastes of Paris into the wilds of western America. These were probably Mr. Shaw's happiest years, to which he always looked back with fullest appreciation of the blessings they bestowed upon him. He had youth, health, friendship, agreeable associations and surroundings; everything except wealth — and that was rapidly coming. Natural business ability of a high order, united with strictest integrity, unrelenting energy, rigid economy and close personal attention, were producing their appropriate fruit.

When the balance sheet for 1839 was struck it showed, to the great surprise of Mr. Shaw, a net gain for the year of $25,000. He could not believe his own figures, and so went over them again and again until he could no longer doubt the fact. Telling the story many years afterward he said it seemed to him then that "this was more money than any man in my circumstances ought to make in a single year," and he resolved then and there to go out of active business at the first good opportunity. The opportunity presented itself very early in the following year, and was promptly improved by the sale of his entire stock of merchandise. So at forty years of age — only the noon of life — with all his physical and mental powers unimpaired and vigorous, Henry Shaw was a free man — and the possessor of $250,000 (equivalent to $1,000,000 in our day) with which to enjoy that freedom. The practical philosophy — usually called common sense, because perhaps it is so very uncommon — which was the ruling feature of his character, was never more clearly and happily displayed than in this retirement. To it he owed what has secured him grateful and generous remembrance forever; to it we, and those who will come after us, owe the rare and precious gifts of perfected Nature whose "infinite variety age cannot wither nor custom stale."

In September, 1840, Mr. Shaw made his first visit to Europe, stopping on the way at Rochester, N. Y., where his parents and sisters resided. The youngest sister, now Mrs. Morisse, accompanied him to England, from whence, after a lengthy stay among relatives and friends, he proceeded alone to the Continent for an extended tour. Returning to St. Louis in the autumn of 1842, he arranged his affairs for another absence in Europe which lasted about three years; during which time he visited all the then accessible European localities, together with Constantinople and Egypt. A contemplated journey to Palestine was arrested by the prevalence of the plague. The journals kept and letters written in the course of these two absences abroad show, what might have been expected, that Mr. Shaw did not travel merely for the sake of traveling, but to see and hear what was most worth seeing and hearing; or, in other words, to acquire that invaluable education which only such intelligent and observing travel can afford. The broad, comprehensive, impartial views of men and things with which he thus supplemented the knowledge drawn from books and from personal experience, may be regarded as completing the culture of his maturer life. Thenceforth he was, in the best sense of the phrase, a man of the world; a cosmopolitan rather — who though living by preference in America, could have been equally at home in any other civilized country.

Early in 1851 Mr. Shaw went abroad for the last time, drawn thither by the first World's Fair, then being held in London. This final visit has a special and peculiar interest to us from the fact that out of it grew, indirectly, the Missouri Botanical Garden and Tower Grove Park. According to his own statement, it was while walking through the grounds of Chatsworth — the most magnificent private residence in Europe — that the fruitful idea first dawned upon him. He said to himself: "Why may I not have a garden too? I have enough land and money for something of the same sort in a smaller way." That idea could not have had a more lovely or more appropriate birthplace than the spot

upon which the hereditary chiefs of the great house of Devonshire have for nearly three hundred years lavished all the resources of ample wealth and cultivated taste; the historic domain which William the Conqueror gave to his natural son, William Peveril; which Sir William Cavendish bought, and began to improve, in the reign of Elizabeth; which for thirteen years was the prison of Elizabeth's cousin and enemy, Mary, Queen of Scots; which before and since has been famous in English song and story, and which to-day is a sight well worth crossing the ocean to see.

Mr. Shaw returned in December, 1851. The mansion at Tower Grove had been finished in 1849 and the one at the corner of Seventh and Locust streets was then being built. From this time forward he was in St. Louis, with the exception of short summer vacations at the Atlantic coast or the Northern lakes. Apparently a man of elegant leisure, he was in reality a very busy man for the next thirty years. An idler he never was until physical weakness compelled him to be such. The idea born at Chatsworth was developing and taking shape.

In 1857 the late Dr. Engelmann, then in Europe, was commissioned in a general way by Mr. Shaw to examine botanical gardens and obtain such suggestions as he might deem of value. The Missouri Garden was begun, by trenching and other preliminary preparation, in that year. About the same time a correspondence was begun with Sir William J. Hooker, then Director of Kew Gardens, who wrote, under date of August 10, 1857: "Very few appendages to a garden of this kind are of more importance for instruction than a library and economic museum, and these gradually increase like a rolling snow-ball." This appears to have decided Mr. Shaw to provide a small library and museum; the building for which was erected in 1858–59. The selection of books was largely entrusted to Dr. Engelmann, in consultation with Hooker, Decaisne, Alexander Braun, and other of his botanical friends. At the same time Dr. Engelmann urged upon Mr. Shaw the purchase of the large

herbarium of the then recently deceased Professor Bernhardi, of Erfurth, Germany, which was offered for sale at a very small price. Writing from Kew on this subject, August 11, 1857, Engelmann says: "You see that Hooker's active spirit is stirring up everything and everybody that comes in contact with him." And Hooker writes — January 1, 1858 — "He (Engelmann) tells me of the herbarium of the late Dr. Bernhardi of Erfurth which he expects to buy for St. Louis. That ought to be a good commencement for the more scientific part of the establishment. * * * The State ought to feel that it owes you much for so much public spirit, and so well directed."

Mr. Shaw has told Professor Trelease, the present Director of the Garden, that he had at one time planned a grand School of Botany, with residences for the faculty, laboratories, etc., opposite the main gate; but abandoned the project because of the wise advice of Dr. Asa Gray, who said that the experiment should be tried in a small way first; as such things cannot be forced, but must grow.

In the summer of 1866 Mr. Shaw was fortunate enough to secure the services of Mr. James Gurney, from the Royal Botanical Garden in Regent's Park, London, whose practical knowledge and experience, and faithful and conscientious devotion to his various duties, won the entire confidence of his employer, and contributed very largely to make Garden and Park what they now are. Mr. Shaw's personal supervision of both was, however, never abandoned; and in this congenial employment, and in perfecting arrangements for the continuance of the noble work he had so well begun, the last twenty-five years of his life were happily and appropriately spent. Until the summer of 1885 he had not been out of St. Louis for nearly twenty years, except for a drive to the neighboring village of Kirkwood to dine with a friend. During the heated term of the year mentioned, he became so much debilitated that his physician insisted upon a change of climate. He went to Northern Illinois and Wisconsin, spending some time at Lakeside on Pewaukee Lake, not

far from Milwaukee. He returned greatly improved and resumed with renewed zeal his usual avocations. But he had passed far beyond the boundary line of three score and ten, and realized the truth of the old verse: —

"For age will rust the brightest blade,
And time will break the stoutest bow;
Was never wight so starkly made
But time and age will lay him low."

On the 24th of July, 1889, he received numerous visitors to congratulate him upon the commencement of his nineti-eth year. He was weak physically, though able to meet them in the drawing-rcom at Tower Grove, and his mind was as clear as ever. This, however, was his last appear-ance in public. An attack of malaria upon an already enfeebled system speedily dissipated all hopes of recovery, and he died at 3:25 Sunday morning, August 25th. The death, peaceful and painless, occurred in his favorite room on the second floor of the old homestead; by the window of which he sat nearly every night for more than thirty years until the morning hours, absorbed in the reading which had been the delight of his life. This room was always plainly furnished, containing only a brass bedstead, tables, chairs, and the few books he loved to have near him. The windows look out upon the old garden which was the first botanical beginning at Tower Grove. On Saturday, August 31st, after such ceremonial as St. Louis never be-fore bestowed upon any deceased citizen, Henry Shaw was laid to rest in the Mausoleum long prepared in the midst of the Garden he had created — not for himself merely, but for all the generations that shall come after him, and who, enjoying it, will "rise up and call him blessed." There, amid the trees, the grass, and the flowers which were so near and dear to him from infancy to old age; with the soft evening sky bending over him like a benediction, and the vesper song of birds mingling with the farewell hymn, he was left to sleep the sleep that knows no waking. And so the long and useful life was rounded to its close.

America was Mr. Shaw's country not merely by adoption, but by deliberate and well-considered choice — a choice he never regretted and of which he was always proud. When he retired from business he was in the prime of manhood, and with wealth amply sufficient in those days for the gratification of tastes far more luxurious than were his. It would have enabled him to live in England, or in any part of the Continent, much more easily and pleasantly, as a gentleman of leisure, than it was then possible to do in America. He had nothing except personal preference to keep him here, and very much, one would suppose, to induce him to take up permanent residence abroad. Yet after long and repeated absences — which, in most cases, would have ended in such residence — he returned to St. Louis to live and to die; to begin, carry forward, and consummate the life-work with which his name will be forever associated.

Yet while Mr. Shaw was so thoroughly American in the true sense of the word, he was as thoroughly English in all those hereditary traits, ideas, and habits which are born in us and not made by us, and which inevitably take their shape and color from the soil and stock from which we spring. "Blood is thicker than water," and the English blood transmitted by a long line of unmixed English ancestry was always strong in him. He did not love England the less because he loved America more, and his attachment for the land of his birth remained deep and ardent — though undemonstrative — to the last. He liked to have about him things which reminded him of his old home. Much of the furniture in both his town and country house was of English manufacture of fifty years ago; most of the pictures and prints upon the walls were of English subjects, and he preferred to read his favorite authors in the English editions through which he first knew them. He was systematic in everything, as Englishmen of his generation were much more than they are now. Systematic in personal habits: eating, drinking, sleeping, exercise and recreation; to which regularity, guided always by pru-

dence, his remarkable health to advanced age was largely due. Systematic above all in his business. Promptness and punctuality were cardinal virtues with him. He put off nothing until tomorrow that could as well be done to-day. Whatever he did himself was well done, and what he could not do himself he placed in competent hands, and whenever practicable gave it careful personal supervision. His penmanship was clear and remarkably handsome, and the books which contain the records of his public and private business would do honor to the best professional accountant. He made out the pay-rolls of both the Garden and Park up to the month of his death, and then allowed another to do it only because utterly unable himself to hold a pen. He managed business matters on strictly business principles, and in so doing knew no difference between a friend and a stranger. He would take no advantage, however legal, of either; but he expected both the friend and the stranger to be as faithful in the discharge of financial obligations and contracts as he himself was — and "his word" was ever "as good as his bond." He was a merchant of the old school, and his ideas of business honesty and honor belonged to the past rather than to the present; nor did he ever, under any circumstances, change them in practice to suit present conditions.

Mr. Shaw knew the value of money, as all men do who have labored for it as he did; but he did not, as many men do, love money for its own sake — for the power it gives or the luxuries it buys. He had none of that feverish greed of gold of which we see and feel so much. He retired from active business when in the very prime of life, content with what now looks like the quite moderate fortune of $250,000. There is every reason to believe that, with his exceptional qualifications for success in this department, he might easily have increased the $250,000 to $2,500,000 long before he had reached the age of sixty. He retired, not because he was afraid of losing what he had made, or thought he could not make any more; but because he felt he had

enough, and intended to enjoy it. He always owned his money; his money never owned him. His tastes and habits were simple and sensible; he lived well but not extravagantly, and with not the slightest attempt at ostentation. Up to the very last years of his life he drove himself the one-horse barouche which was his sole equipage, and not until friends warned him of the dangers incident to growing infirmity did he indulge in a carriage and coachman.

Mr. Shaw was not generous, in the ordinary acceptation of the word; that is, he did not respond to many of the innumerable appeals made to his benevolence, and had no hesitation in declining. In this, as in other things, he knew how to say "No" — and said it very often. He was not uncharitable, but the object of charity had to be unequivocally deserving to obtain assistance from him. He chose — and certainly had the right of choice — to be generous in the large rather than in the small. He reserved his contributions for the benefit of the many, instead of bestowing them upon the few; for the many not merely of his own day, but of all the days to come. From the moment he resolved to make this Garden and this Park for public uses forever, they became the central purpose and motive power of his life. They were wife and children to him. For them he watched and worked, and to them and their present and future interests he consecrated all the energies of body and mind until he could watch and work no more. The Garden and the Park could not be what they are now, could not be what they surely will be hereafter, if the man who planned and perpetuated them had scattered his comparatively limited means among the multitude of applicants. He refused to be generous to some so that he might be more than generous to all.

The following anecdote may be related here: Some years ago Mr. Shaw was escorting a lady visitor through the Garden, and pointing out to her the various rare plants and flowers he knew so well and watched so fondly. She said

to him: "I cannot understand, sir, how you are able to remember all these different and difficult names." "Madam," he replied with a courtly bow, "did you ever know a mother who could forget the names of her children? These plants and flowers are my children. How can I forget them?"

On a certain occasion when a bottle of choice Medoc was upon the table, Mr. Shaw — diluting his glass — remarked with a smile: "I learned to take my wine with a little water, from Montaigne."

He was a great lover of the wise and witty old Gascon (from whose fountain so many writers have drawn their wit and wisdom without acknowledging the debt) and learned from him much more important things than the dilution of his wine. "He was, I think," says a close observer of him, "of the same bent of mind so far as life is concerned." Emerson, in his "Representative Men," takes Montaigne as a typical sceptic, not so much in religion — for, whatever may have been his private opinions, publicly he lived and died a Catholic — but in his general views of life. The device upon his seal was a pair of scales and the motto beneath, in old French: "What do I know?" Mr. Shaw might have adopted the same device and motto, for he certainly was governed in large measure by the principle they set forth. He took as little as possible upon trust, and as far as possible tested everything and everybody before giving his faith and confidence. He believed fully in men and things only after they had been fully tried and found worthy. A gentleman who had long business association with him says: "It was more than two years after our first acquaintance before he was what is called 'social' with me, and five years before he invited me to his house. After that his confidence in me seemed to be established, and was never, so far as I know, withdrawn." But it is doubtful whether Mr. Shaw ever had, at any time, what is called "a bosom friend;" one to whom he could unreservedly reveal himself. He had not that need of sympathy and support which such intimacy usually implies.

He was always self-supporting and self-poised, requiring no outside aid of any kind from any quarter. His friends were many, and he valued their friendship; but the nearest of them felt that they could come just so near, and no nearer — that there was a certain point they could not pass, even if so inclined; a place where he desired no companionship, where he stood alone.

Montaigne, if we may judge from the inimitable "Essays," looked at life from the philosophic standpoint, and rarely suffered his equanimity to be disturbed by any incident or accident, however annoying. In this enviable peculiarity Mr. Shaw followed his example. His naturally high temper was under such complete control that few ever suspected its existence. "In twenty-three years," says Mr. Gurney, the head gardener, "I never heard him speak a harsh or an irritable word. No matter what went wrong — and on such a place and with so many men things will go wrong occasionally — he was always pleasant and cheerful, making the best of what could not be helped." Illustrating this control of temper another informant says: "The only time, I think, I ever saw Mr. Shaw actually angry was when a certain person had failed to keep an important engagement and given a poor, if not provoking, excuse for his failure. Mr. Shaw relieved his mind to me on the subject, speaking very strongly and sharply for some minutes, while I sat watching the unusual exhibition with considerable curiosity. At last he caught my eye, stopped short and said: 'Ah, Mr. A———, I see by your face what you are thinking of. You are thinking that I have lost my temper — and you are right. Let us go into the next room and take a glass of wine together. And will you be kind enough to ask Mr. C——— (the offending party) to dine with me next Sunday?'"

Montaigne — as everybody who has read him knows — was the very prince of egotists, and had, so to speak, reduced egotism to a most delightful science. Mr. Shaw was no egotist, and, if he had a grain of egotism in his composition,

concealed its presence perfectly. In conversation he was reticent rather than the reverse; talked little about himself, and less about what he had done or proposed doing for the public; manifested no anxiety for the appreciative praise he had so justly earned, and when it was given received it with modest dignity, and seldom made any reply beyond a bow and a word of thanks. In manners he was a fair reproduction of

> "A fine old English gentleman,
> One of the olden time"—

Only, perhaps, somewhat less effusive and more dignified than that traditional personage is represented to have been. He was always polite to all, and for ladies especially, had not merely scrupulous politeness, but that stately yet graceful courtesy which belonged to the ancient regime. And beneath it all there was a kind heart. To some one who inquired why he employed so many Bohemians, he replied: "The Bohemians do not seem to be very popular with us, and I think I ought to help them all I can." Walking one day in the Garden with a young lad who was visiting him, he met a lame workman engaged in sweeping up leaves, and greeted him with a "Good morning, Henry." A moment later, noticing that the boy had said nothing: "Charles, you did not speak to Henry. Go back and say 'Good morning' to him." Evidently the fine cynicism of Montaigne had never touched the heart of his admirer.

Mr. Shaw, though he had no knowledge of music, was very fond of it, and moreover, was a strong believer in its elevating and refining influence upon the popular mind. The Sunday afternoon concerts in the Park during the summer months are due to his love for and belief in music. He was always present when health permitted, enjoying himself in seeing others enjoy what he had provided; and was especially pleased when a large audience gathered around the stand which he had adorned with marble busts of the great composers, to listen to their masterpieces.

Perhaps the handsomest compliment ever offered him, and the one most highly appreciated, was the serenade at Tower Grove some two years ago by Gilmore's band, then giving their annual series of concerts at the Exposition. It was a lovely October day, with cloudless skies and mild yet invigorating air; the foliage just beginning to assume the many-colored livery of autumn, but still retaining the luxuriant growth of summer. Mr. Shaw was seated upon the lawn in front of the mansion, with a few friends about him, while at proper distance in front were grouped the sixty-five members of that famous orchestra. As the strains of soul-inspiring music saluted the ear of the venerable gentleman for whom they were primarily intended, his face lighted up with an expression of pleasure too deep for words, and he leaned forward in his chair as if unwilling to lose the faintest note of the divine harmony. The picture of which he was the central figure can never be forgotten by those who saw it; "once seen, became a part of sight."

From youth, until extreme age prevented, Mr. Shaw attended the theatre whenever the performance was of sufficient merit to attract him. He liked all good plays well played, but preferred comedy to tragedy; thinking there is enough real sorrow and suffering in the world without paying to see the unreal article upon the stage. He wanted, especially in his latter years, to be amused rather than deeply interested, and a hearty laugh was worth more to him than all the woes of "Hamlet" or "Lear." So it came to pass that of the four bronze bas-reliefs on the pedestal of the Shakspeare statue, the most conspicuous place is assigned to the one representing the late Ben DeBar in the character of "Falstaff." A friend, who was himself at that time the oldest living actor, good-naturedly remonstrated with him. "Why, Mr. Shaw," said he, "I knew DeBar well, and I liked him, too; he was a first-rate comedian in his line, but not a great dramatic artist by any means. Yet you have honored him as Garrick or Siddons have never been honored, and he don't deserve it, sir!"

HUMBOLDT STATUE IN TOWER GROVE PARK.

"Probably you are quite right, Mr. L——, from a professional point of view," replied Mr. Shaw, with his usual smile, "but I am indebted to Mr. DeBar for a great many very pleasant hours, and am glad of the opportunity to partially repay that debt." It is to his recognition of a much higher order of dramatic ability that we owe the Neilson mulberry tree in the rear of the Shakspeare statue; marking the spot which "the incomparable Juliet" selected on her last visit to St. Louis for the slip from the poet's own mulberry at Stratford, which she would have sent had not untimely death forbidden. When this memorial tree was planted in October, 1880, Mr. Shaw and his old actor friend, Mr. L——, were both present, and threw in the first earth to fill the excavation.

But neither friends, nor books, nor music, nor drama, nor all combined, gave half the pleasure and satisfaction for the last twenty-five years of his life, which the Garden and Park furnished him. He lived *for* them, and as far as was practicable, *in* them; walking or driving every day, when weather and health allowed, and permitting no work of importance to go on without more or less of his personal inspection and direction. The late Dr. Asa Gray — than whom there can be no higher authority — once said: "This Park and the Botanical Garden are the finest institutions of the kind in the country; in variety of foliage the Park is unequaled."

Exactly when the idea of creating what is now Tower Grove Park first came to Mr. Shaw, is unknown; but it was doubtless suggested by what he had seen in Europe, and took active shape when the Garden was firmly established, and seemed to need some such supplementary accompaniment. The first steps were taken in 1866, but the enterprise did not assume definite form until the following year. Since then it has proceeded steadily and systematically, and, until his last illness, literally under the eye of the man who conceived this "thing of beauty" to be "a joy forever." More than 20,000 trees have been planted

here; all raised in the arboretum of the Garden. Mr. Shaw used to say when planting them that he did not expect to live to see these trees reach maturity; that he was "planting them for posterity." But nearly all of that splendid family which he had nursed and reared were fully grown when his coffin passed under their shadowing canopy of leaves to the Mausoleum in the Garden. The Park contains, including the surrounding strip, 276 and $\frac{76}{100}$ acres; and nothing has been omitted, apparently, which could make the perfection of a pleasure ground. The walks, the drives, the ornamental water, the labyrinth, the shady groves, the well-kept grass and fragrant flowers, form a combination of attractions which no lover of Nature can resist. In the midst of these rare surroundings, like jewels in a worthy setting, are three statues of heroic size by Baron von Mueller, of Munich: Shakspeare, Humboldt, and Columbus. These noble bronzes are not merely works of art which any city in any country would be proud to possess, but they are curiously unique. Adelaide Neilson — whose judgment in such matters may be trusted — declared that "she had seen every memorial of Shakspeare of any consequence, public and private, in existence; and that this one was, in her opinion, decidedly the finest." The niece of Humboldt, after seeing this statue of her uncle at Munich, wrote Mr. Shaw, thanking him for the high honor conferred upon her family, and said Europe had done nothing comparable to it for the great naturalist. We know America has not; and we know, too, that neither Europe nor America has a monument to the discoverer of the New World at all comparable to the Columbus in Tower Grove Park. As has been well said: "If dumb metal could speak, the greatest of poets and the greatest of naturalists and the greatest of discoverers would salute each other across these verdant spaces and join in thanking the man who has bestowed upon them such generous and graceful immortality."

What the Missouri Botanical Garden is now, and prom-

THE MAUSOLEUM.

ises to be hereafter, this volume will sufficiently tell. With Garden and Park present and prospective before us, and realizing as far as possible the contributions to human knowledge and human happiness which must flow from them in years to come, we may well say of Henry Shaw, what is written of Sir Christopher Wren in the Cathedral of St. Paul's: —

Si monumentum quæris — circumspice.

AN ACT TO ENABLE HENRY SHAW TO CONVEY OR DEVISE TO TRUSTEES CERTAIN LANDS.

(REPRINTED FROM MO. SESSION ACTS OF 1859, PAGE 434.)

Henry Shaw authorized and empowered to convey certain real estate to Trustees, for certain special objects and uses.

Be it enacted by the General Assembly of the State of Missouri, as follows:

WHEREAS, Henry Shaw, of the county of St. Louis, contemplates to convey or to devise to Trustees certain tracts of land in the Prairie des Noyers Common Fields and in the Gratiot League Square, partly within and partly without the present limits of the city of St. Louis, containing about seven hundred and sixty acres, in trust upon a portion thereof to keep up, maintain and establish a botanic garden for the cultivation and propagation of plants, flowers, fruit and forest trees, and for the dissemination of the knowledge thereof among men, by having a collection thereof easily accessible; by the establishment of a museum and library in connection therewith, as also by establishment of public lectures and instruction upon botany and its allied sciences, when it shall be deemed advisable in furtherance of the general objects of said trust; and the remaining portion to be used for the purpose of maintaining a perpetual fund for the support and maintenance of said garden, its care and increase, and the museum, library and instruction connected therewith, by leasing portions thereof for a term of years, or upon ground or building leases, renewable upon valuation; and whereas, for the purpose of securing to the said institution a permanent fund for all time, which will not be diverted from the specific object which it is designed

to support, it is essential that the said real estate shall be so conveyed, or devised and held, that the same shall not be alienated or alienable;

Therefore, it shall and may be lawful for the said Henry Shaw by his last will to devise, and by proper deed or deeds in his life time to convey, (making use of both or either of said methods of disposition,) to such Trustees as he may appoint, for the uses, trusts and purposes which are generally set forth above, but which may be more specifically described in the instruments creating the same, the whole or such portions of the following tracts of land as he may deem expedient, to wit: All the real estate owned by said Henry Shaw within the following limits, to wit: Grand Avenue on the east, the road running from Grand Avenue to the old Manchester road, on the line between United States surveys number fifteen hundred and nineteen and thirty-two hundred and ninety-four on the north, Arsenal Road on the south, and the King's Highway and the old Manchester road on the west, situated in the Prairie des Noyers Common Fields; also all his interest in a certain tract of land in said Common Fields, bounded north by said Arsenal Road, east by property formerly of James Eggers, south by property of John Tool, and west by the King's Highway; also all of his interest in a certain tract of land in survey of the United States numbered two thousand and thirty-seven, in the name of Charles Gratiot, bounded as follows: North by the County Farm of the county of St. Louis, and east by the King's Highway, south by the county road between surveys number two thousand and thirty-seven and two thousand and thirty-five, and west by the interest of said Shaw in said two last described tracts, being an undivided half thereof; also such other real estate and such personal property as he may think proper so to devise or convey for aforesaid uses, purposes and trusts, and by proper and apt words in said last will or deed or deeds to provide that no absolute alienation shall ever be made of said lands or any portion of the same by

the Trustees therein appointed, their successors or assigns in said trust, but that the same shall forever remain sacred for the objects and purposes of said trust deed; by proper and apt words in said last will or deed or deeds, to provide for the mode and manner of the succession of said Trustees, and for the removal and substitution of Trustees; and it shall and may be lawful for him, among other Trustees which may be therein appointed, to appoint such municipal officers of the city of St. Louis, and such executive and judicial officers of this State of Missouri, as he may think proper, by their style of office; and such officers, when so appointed Trustees, shall hold by virtue of their office, and not as individuals; and the interest in the real estate and property shall be held by them as such officer, and their successors in the office shall succeed to and be vested with all the rights in the property and powers in the trust originally conveyed to and vested in such officer; and it shall also be lawful for said Henry Shaw to convey said property to and appoint himself as one of said Trustees, among others, and in said deed or deeds to reserve to himself the right, during his life-time, to control and manage said garden and institution, and make leases of the lands therein conveyed, as such Trustee.

This act shall take effect and be in force from and after its passage.

Approved March 14, 1859.

HENRY SHAW'S WILL.

ADMITTED TO PROBATE AT ST. LOUIS, SEPT. 2, 1889.

I, HENRY SHAW of the City of St Louis and State of Missouri of sound and disposing mind, but mindful of the uncertainties of life, and desiring specially to carry out and provide for certain objects which have been the subject of thought and labour, and care for many years past, more effectually than I have hereto done, do make publish and declare this, as and for my last will and testament, hereby revoking all other wills by me at any time heretofore made, in manner following, that is to say.

FIRST CLAUSE — I give and bequeath unto M Dwight Collier, Henry Hitchcock, Wm H H Pettus, Dr John B Johnson, Adolphus Meier, Wm G Eliot who is now Chancellor of the Washington University, and his successor in office, Charles F Robertson, who is now Bishop of the Episcopal Church of the diocese of Missouri and his successors, David F Kaime, James Yeatman, Judge Saml. Treat, Joseph W Branch, Gerard B Allen, Rufus Lackland, Judge G A Madill, the President for the time being of the Public Schools, and his successors in office, the President for the time being of the Academy of Science of St Louis, and his successors, the Mayor of the City of St Louis and his successors in office, Dr Asa Gray of Cambridge Masstts and Profr Spencer F Baird, secretary of the Smithsonian Institution, Washington City. The two last named as honorary trustees are added to the trust in recognition of their scientific eminence and ability; the following real and personal property, to wit, all the real estate owned by me at the time of my death within

the following limits, to wit, Grand avenue on the east, the road running from Grand avenue to the Old Manchester Road, and now known as McRee avenue dividing United States survey number fifteen hundred and nineteen (1519) and thirty two hundred and ninety four (3294), on the north; Arsenal street or Road on the south, and Kings highway, and Old Manchester road on the west; excepting such interests and estates as I have heretofore conveyed to the City of St Louis, by two deeds, one bearing date the twentieth day of October 1868, [2] and the other bearing date the ninth of July 1872, and do therein devise to the said City of St Louis for Tower Grove Park; as also such interest as I have conveyed to the Orphans Home, and also to the Calvary Church or the Trustees thereof; all being part or parcel of the Prairie Denoyer Common Fields. Also all the interest estate and property that at the time of my death I may own and be possessed of, in a certain tract of land, bounded north by the said Arsenal road, east by property late of Eggers, south by property of J Tool, and west by Kings Highway, which was originally held by me in common with the late Peter Lindell, and since his death has been divided between his representatives and myself. Also all the estate property and interest which at the time of my death I may own or be possessed of, in a certain tract of land in United States survey numbered two thousand and thirty seven (2037) in the name of Charles Gratiot, and bounded as follows to wit, north by Fyler avenue, east by Kings Highway, south by Pernod Road and west by owners unknown, being the same property owned in common by me with the late Peter Lindell, and since his death divided in partition between his legal representatives and myself; together with the improvements thereon, as also all the household and kitchen furniture of all kinds and descriptions in the house now occupied by me on the tract of land first herein described by me, as also all the plants, trees, flowers and shrubs, contained in the garden grounds, conservatories, green houses, hothouses, and other struct-

ures situated therein, all the library and books and paintings in said house and museum building, and stuffed birds and animals in said museum building, and the herbaria of dried and prepared plants and specimens therein, all the impliments of gardening, horticulture and husbandry, and also all farming utensils, horses, cattle, hogs, poultry, hay, grain, provisions and groceries in and about the said premises, herein first mentioned and conveyed, and the houses, stables, and [3] barns situated thereon. To have and to hold the said real and personel property to them and the survivors of them and their assigns in office forever, in Trust however for the following uses, and purposes, as joint tenants in common, to wit. Whereas I have for many years been engaged in laying out and establishing a Botanical Garden, with a museum and library connected therewith upon a portion of the tract first described, and which is now known as the Missouri Botanical Garden, with the design at the time of my death to convey the same with other property to Trustees for the object and with the view of having for the use of the public a Botanical garden easily accessible, which should be forever kept up and maintained for the cultivation and propogation of plants, flowers, fruit and forest trees, and other productions of the vegetable kingdom; and a museum and library connected therewith, and devoted to the same and to the science of Botany, Horticulture, and allied objects; and whereas as a means of enabling me more effectually to secure the object I have in view, and to preserve the same to the use and enjoyment of the public for all time, the General Assembly of the State of Missouri did pass an act, entitled an act to enable Henry Shaw to convey and devise to Trustees certain lands which was approved of on the 14th day of March 1859; and as it was with the design of carrying out the purpose and object upon which I have been so long engaged, and availing myself of the power given me in said act so far as necessary. I have herein given, devised and bequeathed to said Trustees the property herein specified; I do now declare the uses, pur-

poses and trusts which the said Trustees hold the said property to be as follows.

1st — The said Trustees shall not have the power to make any sale, conveyance or disposition of the real estate herein devised to them or any portion thereof, except as herein specified.

2nd — Said Trustees shall forever keep that portion of the said tract first described, which is now occupied by the Botanical garden, Fruti = [4] Fruticetum, Arboretum, Museum, my residence with such other extent of land as from time to time they may find it expedient or necessary to add thereto for the extension of the said botanical garden and grounds, including the residence of the Director thereof as a Botanical garden for the propogation and cultivation of specimens of plants flowers, fruit, and forest trees for the promotion of science and knowledge, which shall be kept open during such hours, and under such regulations as they shall prescribe every day except sundays, for the use of the public at large.

3rd — The residue of the real estate not required for the immediate purposes of the said Botanical garden in extending the same, whenever it shall appear or seem to the said Trustees necessary, shall from time to time, as the same can be advantageously done, be leased by said Trustees as follows; such portions thereof as can be advantageously leased upon building leases, shall be leased for a term not exceeding sixty years, with a provision in such leases for perpetual renewal thereof for succeeding terms of not more than sixty years, at a rent to be fixed by valuation to be made as therein provided at each term of renewal. Such leases shall also contain a provision that the Leassee as a part of the rent shall pay all taxes general and special, and assessments that may be levied or assessed upon said land so leased. It is my design and object not only that the lands so leased shall afford an income or revenue for the support of the said Botanical Garden, but that it may in the future be so leased as by its improvement its contiguity may be

pleasant and attractive to the visitors and students of the Botanical Gardens. The said Trustees may lease the cottages already erected, and such portions of the said real estate herein before devised, as they do not use for the garden, and cannot profitably lease for building purposes, on short leases to nurserymen, florists, vegetable and market gardeners and others. [5]

4th — Of the Trustees herein mentioned to whom the real and personal property is hereby devised and bequeathed; the Mayor of the City of St Louis, and the Chancellor of the Washington University, the Bishop of the Episcopal Church, the President of the Public Schools, and the President of the Academy of Science, are hereby constituted such trustees by virtue of their office, and not as individuals, and upon their ceasing be to such officers, their functions as such trustees cease, and their successors in office immediately vested with such title to the property, and such rites and duties in relation to the said trust as was possessed by the person ceasing to be such officer. In the event of death, resignation, removal from the city, or permanent inability to serve, of any of the said Trustees, the remaining Trustees will proceed to elect some person fitted by his social position, character and tastes to fill the vacancy; and when any person shall be elected to fill any such vacancy, the other Trustees shall by proper instrument clothe him with the same trusts, interests and power over the said trust property as was possessed by the Trustee in whose place he was elected. In the event of the death of the said Eliot or the said Robertson, I recommend to the said Trustees to fill the vacancy by electing the person who shall succeed to the office or station of the deceased persons above named, and that such selection may be continued to be made upon the death of the individual holding such office and station, so long as the trust shall endure. The said Trustees and their successors in office as herein provided shall constitute a board of Trustees, and said board shall keep written minutes of their proceedings,

shall appoint such executive of such board as they may think fit, and the acts of a majority of the members of said board, done at any meeting regularly held or called shall be deemed or taken for all the purposes of the trust, to be the doings and actings of said board, and of said Trustees, and due notice of any such meeting shall be given [6] by written or printed notices deposited in the post office to the address of each Trustee. The said Trustees at such board shall in accordance with said Trust have full power and authority over, and control of said property hereby devised and bequeathed to them, and the revenue thereof, and its collection and the distribution of the same. They shall have the power of the appointment and removal of the Director and all the other servants and employees connected with the carrying out the objects of the trust. They shall also have the power to prescribe the duties which said Director shall perform, and the other employees and servants connected with the carrying out the objects of the Trust, shall be appointed by them, giving due weight to the recommendations of the Director. The said Trustees shall have the power whenever they shall have an adequate revenue, and they shall deem it advantageous to establish public lectures upon Botany and its allied sciences, and they may at any time call upon the Director to give the same as a part of his regular duties. The Trustees shall have the power to provide for an addition to the collection of plants, flowers, shrubs and trees, indigenous to this or other states or countries, when in their judgment the means at their disposal will authorize it, and make from time to time exchanges of plants, flowers and herbaria, and may provide for the increase of the museum and library, and its enlargement when necessary.

5th — There shall always be a Director to said Botanical garden, and institution, to be appointed as hereinbefore provided, and said board of Trustees shall from time to time prescribe his duties; but when within the sphere of his duties thus prescribed and while he shall faithfully per-

form those duties thus prescribed, the said Director shall not be subject to the interferance, management or controul of said Board; but this is not to be construed so as to take away from the board the permanent control over the garden and grounds of said institution. The director [7] shall always reside upon the grounds specifically set apart for the said institution and garden, and shall have the general superintendance and controul of, and over the gardeners and labourers employed in and about said garden and grounds, and he shall have the general superintendance and charge over the garden grounds, museum and library of said Botanical gardens. He shall devote his entire time and efforts to the interests of the said institution, and he shall, when thereto required so to do, deliver lectures at such place as said Trustees may appoint, upon Botany and matters connected therewith, and he shall employ his energies, that from year to year the institution under his charge shall grow up in efficiency in promoting the ends in view in its inception. When required he shall meet with the board of Trustees, and cooperate with them in matters connected with the interests of the said institution.

6th — The yearly revenue only of the property hereinbefore devised and bequeathed, except such portions of the property herein after devised and bequeathed, as is set apart for, and to be expended on specified objects and uses; shall be applied to the maintenance, preservation and enlargement of the objects of this trust. The said yearly revenue after deducting expenses of collection, taxes, insurance and repairs, shall be applied, as also of the property herein after devised and bequeathed, shall be applied first to the payment of the salaries of the Director, Assistants professors and gardeners, and the payment of the wages of the employees and labourers, in keeping up the grounds in good style and providing for the preservation and increase of the plants and trees, and preserving the buildings and inclosures of the grounds and secondly the purchase of plants, flowers and trees, additions to the

Library, the enlargement, and improvement of the Garden when necessary or advisable, and such other expenditure as from time to time may be found necessary in furtherance of the purposes of this Trust [8]

SECOND CLAUSE. Having established maintained and kept open for the use of the public for many years the Missouri Botanical Garden, and wishing to perfect my endowment of it, and to augment and perpetuate its usefulness by connecting with it a school of Botany for the promotion of education and investigation in that science, and in its application to Horticulture, Arboriculture, Medicine and the Arts, and for the exemplification of the divine wisdom and goodness as manifested throughout the vegetable kingdom.

First — Wherefore I hereby give and bequeath to the Washington University of St Louis a certain lot of ground with the improvements thereon in Block number twenty seven (27) of the city of St Louis, containing fifty five feet in front on the east side of Second Street by one hundred and fifty feet in depth, and bounded north by Greeley, south by (or late) Rankin, east by an alley, and west by Second Street, being the property acquired of Finney. The income of which is to used solely for the maintenance of a School of Botany; said income to be used exclusively to pay the salaries, and defray the necessary incidental expenses of those engaged in botanical instruction, and researches at the Garden, and as need may require also within the precincts of the University; also for the maintenance of the requisite botanical laboratories, and their equipment with instruments and appliances for the illustration and investigation, for the maintenance and increase of a botanical library and herbarium; and for such like objects strictly german to a School of Botany.

Second — To secure harmonious cooperation I require that the professor or professors in the said School of Botany shall be either the Director of the Missouri Botanical Garden, or the person next to him in rank, under what-

ever title, or both of them, or when this is impracticable, said professor, or professors, or teachers, shall be appointed, either by the nomination of the Trustees of the Garden, and approval of the corporation of the University, or else, upon the nomination of [9] of the latter and approval of the former, and whenever the income net, of the property hereby bequeathed to the said University shall fall short of three thousand five hundred dollars ($3500) per annum I require that the Trustees of the Garden shall pay over to the said University, such sum of money as may be required to make the annual income equivalent to three thousand five hundred dollars per annum.

Third — I hereby empower the Trustees of the Missouri Botanical Garden to allot, if they think it expedient, from time to time, any of the income not needed for the developement and maintenance of the said Garden, to the augmentation to the means and appliances of instruction, and also when required and found needful to the erection of another building, similar to the one now occupied as Museum and Library, to be situated west of the same, and equidistant from the residence.

Fourth — I declare my intention that instruction to garden pupils shall be attended to, both in practical and scientific, horticulture, agriculture and arboriculture, and consider it an important feature to always keep up the ornamental and floricultural character of the garden.

Fifth — I also declare that scientific investigations in Botany proper, in vegetable physiology, the diseases of plants, the study of the forms of vegetable life, and of animal life injurious to to vegetation, experimental investigations in horticulture, arboriculture &c are to be promoted no less than instruction to pupils; but I leave details of instruction to those who may have to administer the establishment, and to shape the particular course of things to the condition of the times.

Third Clause — In addition to what I have already above devised and bequeathed to said Trustees above mentioned,

constituted and appointed. I hereby devise to said Trustees, above mentioned, with a view and for the purpose of creating a fund [10] the net income of which, and that alone, is to be applied to the support and improvement of said Missouri Botanical Garden, and under the trust as above designated, the following property real and personal, to wit,

First — A certain lot with improvements thereon in Block sixty five (65) of said City, containing twenty five $\frac{5}{12}$ feet on the west side of Second Street, by one hundred and five $\frac{3}{12}$ feet in depth, and bounded north by, (or late) Wm H Brant, east by Second Street, south (or late) by Coll. Brant, and west by an alley.

Second — Two certain lots with improvements thereon in Block sixty five (65) containing together forty two $\frac{9}{12}$ feet in front on the west side of Second Street, by one hundred and five feet more or less in depth, and bounded north by (or late) Wilkinson, east by Second Street, south by Jenkins, and west by alley.

3rd — A lot of ground with improvements thereon in Block twenty eight (28) of said city, containing twenty three feet $\frac{6}{12}$ feet in front by one hundred and fifty feet in depth, bounded north by by (or late) Jarvis, east by alley, south by (or late) Thornton, and west by Second Street.

4th — A lot with improvements in Block sixty three (63) of said city, containing thirty two feet in front on the west side of Second Street, by one hundred and fifty two feet in depth, and bounded north by (or late) Garnhart, east by Second Street, south by (or late) Ward, and west by an alley.

5th — A lot of ground with improvements in Block thirteen (13) on the north east corner of Main and Vine Streets, containing forty six $\frac{6}{12}$ feet ($46\frac{6}{12}$) in front on the east side of Main Street, and running east ninety feet to Commercial Street or alley, and bounded south by Vine Street, and north by (or late) Crittendon.

6th — A lot of ground with improvements in said Block

thirteen (13) of said City, containing twenty one $\frac{8}{12}$ ($21\frac{8}{12}$) feet on Main street by ninety one $\frac{6}{12}$ feet in in depth, bounded north by (or late) Ferguson [11] east by Commercial Alley or Street, south by Crittenden, and west by Main Street.

7th — A lot with improvements on the west side of Main Street in Block thirty three (33) containing twenty $\frac{7}{12}$ ($20\frac{7}{12}$) feet in front by one hundred and forty feet (140) in depth, and bounded north by (or late) Clemens, east by Main Street, south by (or late) Kearney, and west by alley.

8th — All the lots and parcels of ground that I own in Blocks two hundred and fourteen (214) and two hundred and fifteen (215) in said city, being on the north and south sides of Poplar Street, and between Twelvth and Thirteenth Streets, except the lot of ground with improvements thereon on the north side of said Poplar Street, herein devised to Mrs Rebecca Edom.

9th — A certain lot on the alley in Block sixty five (65) and in rear of lot herein described and devised in 2nd paragraph being about twenty eight $\frac{6}{12}$ feet on alley, and running west about thirty seven $\frac{6}{12}$ feet to a lot of (or late) Mrs Pendleton, bounded east by alley, north by property formerly of Picotte, and south by property formerly of Isaac Walker.

10th — A lot of ground in Block one hundred and eighty one (181) of said city, with the improvements thereon, being my city residence, bounded south by Turner, east by Seventh Street, north by Locust Street and west by alley, being ninety $\frac{8}{12}$ ($90\frac{8}{12}$) feet on Seventh Street, and one hundred and twenty seven $\frac{7}{12}$ ($127\frac{7}{12}$) feet on Locust Street.

11th — A lot in Block thirteen (13) of said city with improvements, containing twenty three feet in front by ninety (90) feet in depth, and bounded north by (or late) Wiggins, east by Front Street, south by Tiffany, and west by Commercial alley.

12th — A lot in said Block Thirteen (13) with improvements containing twenty seven and one half ($27\frac{1}{2}$) feet in

front by ninety (90) feet in depth, bounded north by (or late) Devillers, east by Front [12] Front Street, south by (or late) Wiggins, and west by Commercial Street.

13th — A lot in Block thirteen (13) with improvements containing twenty three feet in front by ninety (90) feet in depth, and bounded north by Tiffany, east by Front Street, south by trustees of Benjamin C Sanford, and west by Commercial Street.

14th — A lot in Block twelve (12) of said city containing twenty three (23) feet in front by ninety (90) feet in depth, with the improvements thereon, bounded north by (or late) Campbell, east by Front Street, south by (or late) Gay, and west by an alley.

15th — All the lots owned by me with the improvements thereon in Block fifty three of said city, being one lot on the north west corner of Second and Plum Streets, containing twenty four (24) feet on Second Street by eighty (80) feet in depth, bounded north by Dehil, east by Second Street, south by Plum Street, and west by myself; one lot containing eighty $\frac{5}{12}$ ($80\frac{5}{12}$) feet on Plum Street by eighty-seven $\frac{9}{12}$ ($87\frac{9}{12}$) feet in depth, bounded south by Plum Street, east by myself, and Dehil, and west by Claes; one lot containing thirty six $\frac{8}{12}$ ($36\frac{8}{12}$) feet on Second Street by eighty (80) feet in depth, bounded south by Dehil, and west by myself.

16th — Two lots with warehouses thereon in Block ten (10) of said city containing together forty nine (49) feet on Front Street by ninety seven feet in depth, and bounded north by (or late) Brown, east by Front Street, south by the property of (or late) L M Kennett's estate, and west by Commercial Street or Alley.

17th — I also will and devise further to the said Trustees of said Missouri Botanical garden, named in the first clause of my will, a certain lot of ground situated on the south side of Market Street in the said City of St Louis, between Fourth and Fifth Streets, containing sixty (60) feet in front by one hundred and forty five feet (145) more or less in

depth, bounded north by Market Street, south by an alley, east by Price, and west by [13] Charless and Bourgois in city Block one hundred and three (103) and purchased by me from the trustees Eliza A W Blow deceased.

18th — A lot of ground with improvements thereon in Block ninety-eight (98) with a front of forty eight (48) feet, by one hundred and twenty seven $\frac{5}{12}$ ($127\frac{5}{12}$) feet in depth, bounded east by Fourth Street, north by St Charles street, west by an alley and south by premises now occupied by Scruggs Vandervoot and Barney.

19th — A lot of ground with improvements thereon in Block one hundred and eighteen (118) with a front of sixty six feet (66) on on Sixth Street, by eighty nine $\frac{1}{8}$ ($89\frac{1}{8}$) feet on St Charles Street, bounded west by Sixth Street, north by St Charles Street south by Chirchill and east by Van Studdiford.

20th — A lot of ground with building thereon in Block one hundred and nineteen (119) with a front on Washington Avenue of twenty three feet (23) by seventy five feet deep (75), bounded north by Washington Avenue, west by Beach, and east and south by self.

21st — A lot of ground with building thereon in Block one hundred and nineteen (119) with a front on Washington Avenue of forty six (46) feet by seventy five (75) feet in depth bounded north by Washington Avenue, west and south by self, and east by Hugh L White.

22nd — A lot of ground with buildings thereon in Block one hundred and nineteen (119) with a front on St Charles Street of forty five (45) feet, by seventy five (75) feet deep, bounded south by St Charles Street, north by self, and east by property now occupied by Eli Walker & Co, and west by (or late) Isaac Walker.

23rd — A lot of ground with improvements in Block one hundred and twenty six (126) with a front of twenty five (25) feet on Washington Avenue, by a depth of one hundred and fifty one $\frac{5}{12}$ ($151\frac{5}{12}$) feet to St Charles Street, now leased to Leath, bounded north by Washington Ave-

nue, south by St Charles Street, east by Leath, [14] and west by Mary T Barrett.

24th — A lot of ground with improvements in Block one hundred and twenty six (126) with a front of thirty three (33) feet on Washington Avenue, by a depth of seventy five (75) feet on Seventh Street bounded north by Washington Avenue, west by Seventh Street, south by self, west by Seventh street, and east by (or late) Bissell.

25th — A lot of ground with building thereon in Block one hundred and twenty six (126) with a front of thirty two (32) feet on St Charles Street, by a depth of seventy six (76) feet on Seventh Street, bounded south by St Charles Street, west by Seventh Street, north by self and east by (or late) Bissell.

26th — A lot of ground with four tenements thereon in Block eight hundred and twenty (820) with a front of eighty eight $\frac{5}{12}$ ($88\frac{5}{12}$) feet on Lafayette Avenue, by a depth of one hundred and two $\frac{6}{12}$ ($102\frac{6}{12}$) feet to an alley, bounded north by Lafayette Avenue, west by Dorshimer, south by an alley, and east by Linn Street.

27th — A lot of ground and store building thereon in Block twenty eight (28) of said city with a front on Second Street of thirty five $\frac{9}{12}$ ($35\frac{9}{12}$) feet, by a depth of one hundred and thirty seven (137) feet, bounded north by McDowell, south by Maffit, west by Second Street, and east by a twenty foot alley.

28th — A lot of ground and store building thereon in Block sixty four (64) of said city, with a front on Second Street of thirty one $\frac{4}{12}$ ($31\frac{4}{12}$) feet, by a depth of one hundred and fifty two $\frac{4}{12}$ ($152\frac{4}{12}$) feet, bounded south by Alexander, north by (or late) Bauvais, east by Second Street and west by alley.

29th — I also further devise and bequeath to the Trustees of the said Missouri Botanical Garden for the purposes hereintofore stated, all the estate property and interest I may [15] own and possess at the time of my decease to a certain tract of land in United States Survey No 2037, and

which was originally held by me in common with the late Peter Lindell, lying west of the city Poor house, bounded east by city land, north by Arsenal street, west by Tamm Road and south by parties unknown, containing fifty two acres more or less, part of which is leased to Jansen.

30th — In the 10th and preceding paragraph of this my will and testament, I devise and bequeath my property in Block 181 of said City to said Botanical garden, including my present City residence, corner of Locust and Seventh Streets, which said residence being built of good and durable materials, but unsuitable to its present locality; it is my desire that when deemed advisable by the Trustees of said Missouri Botanical Garden to have the said residence carefully taken down and rebuilt on Tower Grove Avenue in some convenient situation in contiguity to said Botanical Garden: and for the said removal and rebuilding I hereby bequeath to the said Trustees the sum of ten thousand ($10,000) Dollars; and the ground so devested of said residence, to be leased by said Trustees for such term as they may deem expedient for the benefit of said Missouri Botanical Garden.

31st — It is my desire and intention that the bequest made payable in money in this my will, will be paid with as little delay as convenient, and that my administrator provide for the payment of same, by sale of such notes secured by deed of trust, or shares of the capital stock of the St Louis Gas Light Company, or shares of stock in the Planters House Hotel, that I may own at the time of my decease. [16]

FOURTH CLAUSE

1st—I hereby devisise and bequeath to my dear sister Caroline Morisse the wife of Julius Morisse the lot of ground and building thereon in Block ninety four (94) with a front of thirty $\frac{9}{12}$ ($30\frac{9}{12}$) feet on North Fourth street, by a depth of one hundred and twenty seven $\frac{6}{12}$ ($127\frac{6}{12}$) feet to an alley, bounded east by Fourth street, west by an alley, north by Commerial Mutual &c Co, and south by (or late) Bryan, and now occupied by Morisse as a hardware store, and by

Williams as a hotel and boarding house. To have and to hold the same unto the said Caroline Morisse forever; and also to my said sister Caroline I hereby devise during her life time, the house and lot on Shaw avenue Place, next south to the northwestern corner house devised in this my last will and testament for her life time to Mrs Rebecca Edom; and at the death of my said sister, I devise that the house and lot revert back as the property of the said botanical garden, they the said Trustees to pay taxes and insurance on said house and lot during the life time of my said sister Caroline Morisse. I further devise and bequeath to my said sister Caroline Morisse the sum of five thousand (5000) Dollars.

2nd—I give and bequeath to Mrs Rebecca Edom my house keeper at Tower Grove and Locust street the property on Poplar street between Twelvth and Thirteenth streets, fronting seventy (70) feet more or less on the north side of Poplar street, and extending north seventy (70) feet to a private alley, bounded east by an alley, west by the east wall of a row of five brick houses standing on said lot, south by Poplar street and north by self. To have and to hold to the said Rebecca Edom, and heirs and assigns forever.

In further consideration of the services of said Mrs Rebecca Edom, as housekeeper and nurse in my old age, in addition [17] to the property devised in this paragraph of my will, I hereby devise and bequeath to the said Rebecca Edom the sum of five thousand ($5000) Dollars, and further hereby devise to the said Rebecca, a certain lot of about eighty feet front or width with a dwelling house thereon, being the northwestern house of the ten houses erected by me on Shaw avenue place, bounded north by Tonty street and west by Mercy street, during her lifetime and at her death I hereby devise the same to the Trustees of the Missouri Botanical garden; they the said Trustees to pay taxes, and insurance on said house and lot during the lifetime of the said Rebecca. Also I further bequeath

to the said Rebecca Edom, my one horse carriage made by Salorgne, and one that she may select of my carriage horses, all my wearing apparel, and also the following articles of furniture to the said Rebecca, at present in my city residence on Locust street and Seventh street, to wit, one mantel clock, the mahogany side board, dining table, and six chairs of mahogany and morocco leather, two looking glasses, two oil paintings of fruit, all the plated ware, spoons, forks, covered dishes and dish covers, knives, plates, dishes, china-ware, tea and coffee sets, and accessories to tea services; at present in and about the dining room of my said city house; one rosewood bedstead with mattresses, and pillows, one bureau with marble top, one rosewood wardrobe with glass door, one wash stand chairs & tables now in my bedroom in said house, also the bedroom furniture in the south room of the third story of said house, and one dozen each of port and sherry wine, and two dozen bottles of claret wine, from my wine cellar in said house

3rd — I give and bequeath to Joseph Monell M. E. late of Washington University, and now employed at the Desloge Lead Works St Francois County Mo, the property in Block one hundred and twenty seven (127) of said city, containing [18] forty five and one half feet ($45\frac{1}{2}$) on St Charles street, by fifty seven (57) feet on Seventh street, bounded north by St Charles street west by Seventh street, east by (or late) Patton, and south by or late Ellard. To have and to hold to the said Joseph Monell, and his heirs and assigns forever.

4th — I give and bequeath to my cousins in England, to wit, to Henry E Hoole of Ravenfield Park, nr. Rotherham, to Joseph Hoole London, to Miss Mary Hoole, Craven Garden Bayswater London, to Henry Hoole, Malvern, all in the Kingdom of Great Britain, to each the sum of one hundred pounds (£100) sterling.

5th — I give and bequeath to Mrs Eliza Lowe (late Mrs Eliza Hoole) the wife of Revd Hubert Lowe, the sum of two hundred pounds (£200) sterling; to Percy Hoole esqr

the son of Henry Elliot Hoole, of Ravenfield Park, to James Hoole esqr of Edgefield Bradfield parish near Sheffield, also to Mrs Mary Hodge, widow, and to her sister Mrs Eliza the daughters of Henry Hoole of Malvern, to each the sum of one hundred (£100) pounds sterling; and also to the said James Hoole of Edgefield the portraits of my dear deceased mother, and of her brother my deceased Uncle, both said portraits with their frames now hanging in the dining room of my city residence, to be securely packed at the expense of my estate, and forwarded free of expense to the devisee; all these parties of the kingdom of Great Britain.

6th — I devise and bequeath to my relative Mr Frank Bradbury a native of Sheffield Engld, and now a resident of the City of St Louis, the house and lot for his life time, on Shaw avenue Place, next adjoining and south of the house and lot devised for her life time to my dear sister Mrs Caroline Morisse, said lot to said Bradbury, being about eighty (80) feet feet in width, and bounded west by Mercy street, and east by property devised to the Missouri Botanical Garden; to the said Frank Bradbury, during the term of his natural life, and then the said house and ground to revert to the Trustees for the purposes of the said Mo Botanical Garden [19]

7th — I hereby give and bequeath to the heirs of my deceased cousins, James Shaw, Joseph Shaw, and Wm Shaw now residing in, or near the city of New York, and the heirs of their deceased sister, Mrs Vitty, now or late of Philadelphia, to each family of my four deceased cousins the sum of one thousand dollars, aggregating the sum of four thousand ($4000) Dollars to the descendants of my late cousins, none of whom have I ever seen except one.

8th — I hereby give and bequeath to Mrs Sarah Barber, widow, now (or late) of Roscoe Place, Sheffield, England, the sum of one hundred (£100) pounds sterling.

9th — In further consideration of the services of the aforesaid Mrs Rebecca Edom, as housekeeper and nurse in my

old age, I hereby devise and bequeath to the said Rebecca Edom during her lifetime the lot of ground owned by me, with improvements thereon in Block one hundred and twenty nine (129) of a width in front, on Olive street of twenty $\frac{6}{12}$ ($20\frac{6}{12}$) feet by a depth of one hundred and six (106) feet more or less, bounded north by Olive street, west by an alley, south by Rudolph and east by same being the property as at present occupied by Kaime and Brother, to the said Rebecca Edom for her natural life, she paying taxes and insurance, and repairs, and at her decease, I hereby devise and bequeath the said house and lot to St Lukes hospital, being a corporation now situated on Washington avenue, city of St Louis to have and to hold the same forever, for the support of the said hospital, and for no other purpose; also to the said hospital I hereby give and bequeath the sum of one thousand dollars.

10th — I give and bequeath to the Good Samaritan Hospital of St Louis the sum of one thousand ($1000) Dollars.

11th — I give hereby and bequeath to the Academy of Science of St Louis, the sum of one thousand ($1000) Dollars.

12th — I hereby give and bequeath to the Missouri Historical Society of St Louis the sum of one thousand ($1000) Dollars. [20]

13th — I hereby devise and bequeath to my aforesaid dear sister Mrs Caroline Morisse for her natural life, a lot of ground with improvments thereon, in city block nineteen hundred and eighty four (1984), of a width of thirty (30) feet on Sheridan avenue, by a depth of ninety nine $\frac{4}{12}$ ($99\frac{4}{12}$) feet, bounded south by Sheridan avenue, north by an alley, east by (or late) Keiler, and west by and at the death of my said sister Caroline, I hereby devise the said house and lot to the Episcopal Orphans Home, and which said orphanage is on Grand avenue, to them for the maintenance of said Orphans Home,

to have and to hold forever: also to the said Episcopal Orphans Home, the sum of Two thousand ($2000) Dollars.

14th — I give and bequeath to the Protestant Orphan Asylum the sum of one thousand ($1000) Dollars; the said Asylum being a corporation located in the county of St Louis.

15th — I hereby give and bequeath to the Home of the Friendless (Old Ladies Home) one thousand ($1000) Dollars, the said Home of the Friendless being a corporation of the City of St Louis.

16th — I give and bequeath to the Memorial Home of St Louis, an institution located on Grand Avenue near Tower Grove Park the sum of one thousand ($1000) Dollars.

17th — I give and bequeath to the Little Sisters of the Poor, a Catholic institution of St Louis the sum of one thousand ($1000) Dollars.

18th — I hereby give and bequeath to St. Georges Society of St Louis, whereof, Wm Ellison is president, and J W Branch is Treasurer, one thousand dollars ($1000).

19th — I hereby give and bequeath to the Caledonia Society of St Louis, whereof Dugald Crawford is (or was) president, the sum of one thousand ($1000) Dollars.

20th — I give and bequeath to Mr Geo I Barnett, Architect of the city of St Louis, the Mantel Clock bequeathed to me by [21] the late Manoel De França, and now in the library of my city residence, and also to the said Barnett the ancient oil painting of the Falls of Terni in Italy, said to be by Rosa de Tivoli, also now hanging in said library: also two dozen of my best sherry wine from cellar in my city house.

21st — I give and bequeath to Mr David F Kaime of the firm of J E Kaime & Bros my barouche carriage made by Brewster of New York, with set of double harness, also to said D F Kaime two dozen bottles port wine from cellar at city house.

22nd — I hereby give and bequeath to Mr J E Kaime of Kaime & Bros Two dozen port, and two dozen sherry wine from my aforesaid cellar.

STATUE OF VICTORY.

23rd — I hereby give and bequeath to D H MacAdam Esqr of this city but now residing at Kirkwood, my gold Jergensen watch, also two dozen port or claret wine as he may select from my city house cellar; also to said MacAdam my folio edition of Shakspeare.

24th — I hereby bequeath one thousand ($1000) dollars annually for a banquet to the Trustees of the garden, and to the guests they may invite, litterary and scientific men, and friends and patrons of the Natural sciences; to be paid each year out of the funds devised for the support of the Garden; also four hundred dollars annually from the same fund for a banquet to the gardeners of the institution, and invited florists, nurserymen, and market gardeners of St Louis and vicinity, said banquet to be presided over by the Director of said Botanical Garden.

25th — I hereby bequeath five hundred dollars annually for premiums or prizes to a flower show or exhibition, when such flower show may be established by amateurs and horticulturists of St Louis to be paid each year out of the funds of the garden.

26th — I hereby devise and bequeath two hundred dollars annually to the Bishop of the Episcopal Church of this diocese, in consideration [22] (if he approve of the same) that an annual sermon be preached in such church, and by such minister as he may select; on the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vegetable kingdom; to be paid annually out of the funds of the said Botanical Garden.

27th — I hereby devise and bequeath to the Mercantile Library of St Louis my thirty (30) shares in the Mercantile Library Hall Company of St Louis, and all my interest in the same.

28th — I hereby give and bequeath to the Girls Industrial Home of St Louis, of which Catherine T Baker is (or was) matron, the sum of one thousand ($1000) Dollars.

29th — I hereby give and bequeath to the German Prot-

estant Orphans Home of St Louis, of which J. H. Conrades is (or was) president the sum of one thousand ($1000) Dollars.

30th — I hereby give and bequeath to the Methodist Orphans Home, of which Mrs E L Walker is (or was) matron the sum of one thousand ($1000) Dollars.

31st — I hereby give and bequeath to the Young Mens Christian Association of St Louis the sum of one thousand ($1000) dollars.

32nd — I give and bequeath to Mr James Gurney the head gardener at the Missouri Botanical Garden the sum of three hundred ($300) Dollars; to Constance Strobel, and Michael Savadil each the sum of one hundred & fifty ($150) Dollars, and to my other employees and labourers, who at my decease are, and may have been in my service for five years or more the sum of seventy five ($75) Dollars each.

33rd — Having provided a mausoleum and tomb in the grove of the Missouri Botanical Garden, my desire is to be buried in the same, and upon which some work remains to be done, which if not finished in my life time, I hereby devise twelve thousand ($12,000) dollars to finish the same (and for other purposes herein mentioned) [23] the work of the mausoleum and monument to be completed if so required agreable to plans in the hands of Mr Geo I Barnett the architect, and also to pay for the grave stone, if so required shortly expected from Munich, Germany. It is also my desire that a small brick cottage be provided as a residence for a man to be employed; whose duty it shall to keep in order the said mausoleum, museum building or buildings the grove, and the grounds around, for all time to come, salary to be paid out of the general fund belonging to the said Trust, and said employee to be under the controul of the Director of the garden, same as the other employees of the aforesaid institution. Also out of the devise of twelve thousand dollars; fifteen hundred (1,500) dollars to Mrs Rebecca Edom my aforesaid housekeeper for my funeral expenses, and not

to exceed that sum; agreable to my written memorandum of items left with her as instructions. It is also my desire that the remains of no other person be buried within the limits of the Missouri Botanical Garden.

34th — In the first clause, and second paragraph of this my last will and testament, I devise and express my wish that the garden shall be kept open, under necessary regulations, sundays and holidays excepted, every day of the week. Now as this Trust is made for the use of the citizens of St Louis as well as the public in general; it is my wish that for the convenience of said citizens and public, that the Garden shall be open to visitors two sundays in each year, viz, the first sundays in June, and the first Sunday in September, from Two P M to sunset.

35th — I hereby direct my administator or executor, as soon afer my decease as it can be done, to turn over to the Trustees aforesaid, of the Missouri Botanical Garden, named in the first clause of this my will, all the real estate devised to them in this will, also, all the personal property of all [24] kinds, devised and bequeathed to them contained in and upon the said garden and grounds, or upon the tract herein first described, the house, buildings and improvements thereon, and as there will be found an inventory of the plants connected with and embraced in said Botanical garden and grounds, or upon the tract aforesaid; and as the plants are removed at times from the plant houses into the garden, it is sufficient for my executor or administrator to inventory said plants for the purposes of my estate as the plants, flowers and shrubs belonging to the Missouri Botanical Garden as contained in inventory, and said Trustees shall receipt to my executor or administrator in full of such plants &c as contained in said inventory as the shrubs plants & flowers of the Missouri Botanical Garden.

36th — Also all the residue of my estate real and personal or mixed, which I may leave, or be possessed of at the time of my death, which shall not have been in this my will devised, bequeathed and disposed of, I devise and bequeath to

said Trustees. To have and to hold to them and the survivors of them, and their successors in said Trust forever upon the said uses and trusts above mentioned.

Corrections — 1st — in page 2, line 2 — read "*convey*" instead of "devise"

" 2nd in 4th paragraph of 1st clause, 9th line change "rites" to "rights."

37th — I hereby nominate and appoint The Public Administrator for the time being, to be the executor or administrator of this my will. I testimony whereof I have hereto set my hand & seal, this twenty sixth day of January Eighteen hundred & eighty five

HENRY SHAW [Seal]

Signed, sealed, published and declared as, and for his last will and testament by Henry Shaw, who in our presence, and in his presence, and at his request, and in [25] the presence of each other have hereto subscribed our names as witnesses thereto of the day and year above written.

W A CLENDENIN.
E. W. PIKE
JULES DESLOGE

STATE OF MISSOURI, } *ss.*
CITY OF ST. LOUIS. }

Be it remembered, that on this 2d day of September A. D. 1889, before me, the undersigned, Clerk of the Probate Court of the City of St. Louis, personally came William A. Clendenin, Edward W. Pike and Jules Desloge who being each by me duly sworn, on their oaths say:

" We saw Henry Shaw, the testator subscribe his name

to the annexed instrument, in writing, bearing date the 26th day of January, 1885, and heard him declare the same to be his last Will and Testament; we subscribed our names thereto as witnesses in the presence and at the request of the said testator and at the time of the execution of said instrument as aforesaid, and of our subscribing the same as such witnesses, he the said testator was of sound and disposing mind, to the best of our knowledge and belief. Said testator died on or about the 25th day of August, 1889."

Sworn to and subscribed before me, this 2d day of September A. D. 1889. } W. A. CLENDENIN, E. W. PIKE, JULES DESLOGE.

W. E. WAGNER, *Clerk*.
By B. W. MCILVAINE, D. C.

STATE OF MISSOURI, } *ss.*
CITY OF ST. LOUIS. }

I, Wm. E. Wagner, Clerk of the Probate Court of the City of St. Louis, having examined the annexed instrument in writing, together with the testimony of William A. Clendenin, Edward W. Pike and Jules Desloge, subscribing witnesses thereto, do consider the same as duly proved to be the last Will and Testament of Henry Shaw, deceased.

IN WITNESS WHEREOF, I hereunto set my hand and affix the Seal of said Court, at office, this 2d day of September, 1889.

SEAL

W. E. WAGNER, *Clerk*.
By B. W. MCILVAINE, D. C.

STATE OF MISSOURI, }
CITY OF ST. LOUIS. } *ss.*

In the Probate Court for the City of St. Louis, September term, 1889, Monday, September 9, 1889.

ESTATE OF HENRY SHAW. } Probate of will approved.

Now at this day the Court examines and approves of the probate of the last will and testament of Henry Shaw, late of the City of St. Louis, deceased, taken and granted by the Clerk of this Court, in vacation, on the 2d day of September instant, and orders that the same be certified accordingly.

STATE OF MISSOURI, }
CITY OF ST. LOUIS. } *ss.*

I, Wm. E. Wagner, Clerk of the Probate Court within and for the City of St. Louis aforesaid, do hereby certify the foregoing to be a true and complete copy of the last Will and Testament of HENRY SHAW, deceased, and of the probate thereof, and of the order of said Court approving said probate, as fully as the same respectively remain on file and appear of record in my said office.

IN WITNESS WHEREOF, I hereto set my hand and affix the seal of said Court, at office, in St. Louis, this 14th day of September, 1889.

W. E. WAGNER, *Clerk.*

SEAL OF THE PROBATE COURT OF THE CITY OF ST. LOUIS, MISSOURI.

STATE OF MISSOURI, } *ss.*
CITY OF ST. LOUIS. }

I, the undersigned, Recorder of Deeds for said City and State, do hereby certify that the foregoing instrument of writing was filed for record in my office, on the Seventeenth day of September, A. D. 1889, at 8:40 o'clock A. M., and is truly recorded in book 925 Page 229.

WITNESS my hand and official seal on the day and year aforesaid.

WM. A. HOBBS,
Recorder.

RECORDER OF DEEDS SEAL, ST. LOUIS, STATE OF MISSOURI.

DEED FROM HENRY SHAW TO WASHINGTON UNIVERSITY.

(ACKNOWLEDGED AND RECORDED OCTOBER 14, 1885.)

THIS DEED, made and entered into this twenty third day of July, one thousand eight hundred and eighty five, by and between HENRY SHAW, of the City of St. Louis, State of Missouri, and WASHINGTON UNIVERSITY (a corporation created and existing under the laws of the State of Missouri and located in the City of St. Louis), WITNESSETH: Whereas the said Henry Shaw has established, maintained and kept open for the use of the public for many years, the Missouri Botanical Garden located in said City of St. Louis, and desires to augment and perpetuate its usefulness by endowing a school of botany as a department of said Washington University: And Whereas said Washington University has, by appropriate action, established a school of botany as a special department of said University under and by the name of the "Henry Shaw School of Botany" and has also established a Professorship of Botany which is to be known as the "Engelmann Professorship"; and Whereas by the action establishing the said school of botany the same is placed under the special care and direction of a managing committee of five members, of whom two are to be members of the Board of Directors of said Washington University, two are to be selected outside of such Board, and the remaining one is to be the Chancellor of said University: NOW THEREFORE, in consideration of the premises and the sum of One Dollar to him paid, the said Henry Shaw has granted, bargained and sold, and does by these presents GRANT, BARGAIN and SELL, CONVEY and CONFIRM unto the said Washington University, forever, the following described real estate lying and being in the City of St. Louis, State of Missouri, that is to say: A certain

lot of ground, with the improvements thereon, in Block Number Twenty seven (27) of the City of St. Louis, containing fifty five feet (55′) front on the east side of Second Street, by one hundred and fifty feet (150′) in depth and bounded north by Greely, south by Rankin, east by an alley and west by Second Street, and being property acquired by the said Henry Shaw of Finney.

To have and to hold the said premises together with all the rights, immunities, privileges and appurtenances to the same belonging, unto the said Washington University, and to its assigns forever, but nevertheless upon the express condition following, that is to say: the net income derived and to be derived from the premises hereinabove described and from every part thereof shall be devoted solely to and used by said Washington University exclusively for the maintenance of the said School of Botany, so created by said University as hereinabove stated, in paying the salaries and defraying the necessary incidental expenses of those engaged in botanical instruction and researches, and for the maintenance of requisite botanical laboratories with instruments and appliances for illustration and investigation and for the maintenance and increase of the botanical library and herbarium and for such like objects strictly german to such school of botany. And in the event the said Washington University shall fail in any particular to keep, observe and perform each and every feature of the condition hereinabove expressed, and upon which this conveyance is expressly made, then and thereupon and without let or hindrance from any source or quarter, the said premises and the title thereto and all improvements thereon and rights, privileges and appurtenances connected therewith, shall revert to said Henry Shaw, his heirs and assigns, and the said Henry Shaw, his heirs and assigns may enter and take full and unqualified possession of said premises and of every part and parcel thereof. And it is further expressly declared that the acceptance of this deed by the grantee shall be deemed

conclusive proof that it acquiesces in and assents to and agrees to perform and to be bound by each and every feature of the condition hereinabove set forth.

IN TESTIMONY WHEREOF the said Henry Shaw has hereunto set his hand and seal the day and year first in this instrument stated. HENRY SHAW. SEAL

STATE OF MISSOURI, } ss.
CITY OF ST. LOUIS. }

On this 14 day of October 1885, before me personally appeared Henry Shaw, to me known to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same as his free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand with my title of office, and affixed my notarial seal the day and year first in this certificate stated.
(NOTARY'S SEAL.) GEORGE M. BLOCK, *Notary Public.*

STATE OF MISSOURI, } ss.
CITY OF ST. LOUIS. }

{ RECORDER'S SEAL. }

I, the undersigned, Recorder of Deeds for said City and State, do hereby certify that the foregoing instrument of writing was filed for record in my office on the Fourteenth day of October A. D. 1885, at 2:11 o'clock P. M., and is truly recorded in Book 773 Page 137.

WITNESS my hand and official seal on the day and year aforesaid.

THOS. F. FARRELLY, *Recorder.*

THE MUSEUM GATE.

THE HENRY SHAW SCHOOL OF BOTANY.

INAUGURAL EXERCISES.

IN MEMORIAL HALL, NOVEMBER 6, 1885.

Prayer having been offered by the Rev. James G. Merrill, Pastor of the First Congregational Church, the following Historical Statement was made by the Chancellor of the University: —

This evening, Washington University inaugurates a new Department of scientific work. In some respects the enterprise is particularly worthy of note.

Heretofore, from the very beginning, every step in our progress has been taken, as it were, in the dark, as when one puts his foot forward not knowing whether it will be upon firm ground or in vacancy, with reasonable fear that each step might be the last. As one Department after another has developed itself, we have been building upon hope, with only that assurance of success which earnest faith and endeavor always inspire. Looking back through all these years of trial and difficulty, we may well be surprised at the steadfastness of purpose and munificent generosity of those who have worked with us, so many of whom have passed away, but of whom some of the most faithful are yet left, while younger men are rising up, from time to time, worthily to fill the vacant places.

To-day, we have met to inaugurate a new enterprise in one of the highest departments of scientific culture, not only with ample endowment for the present, but with wise provision, if we know how to do our work faithfully and well, for future development and growth.

It is nearly two years ago that the suggestion was first made to me by our fellow-citizen Mr. Henry Shaw, and it seemed to me almost too good to be true. But after several consultations with Dr. Asa Gray, the distinguished botanist of Harvard University, Mr. Shaw authorized me to place before the Board of Directors a definite plan of action, as follows: —

That he proposed with concurrence of the Directors, to endow a SCHOOL OF BOTANY as a Department of Washington University, by donation of improved real estate, yielding over $5,000 revenue, and to place it in such relation with the largely endowed "Missouri Botanical Garden and Arboretum," as would practically secure their best uses, for scientific study and investigation, to the professor and students of the said School of Botany, in all time to come.

Dr. Gray had taken a most kindly interest in this movement, and had twice visited St. Louis on Mr. Shaw's invitation, for the special purpose of consulting with him and others, as to the best methods of action in organization of the school. By his recommendation, correspondence was opened with Mr. Wm. Trelease, Professor of Botany in Wisconsin University, at Madison, a graduate of Cornell University, who had already attained to a high rank in this department of science, and who visited Mr. Shaw to inform himself of the leading features of the proposed situation.

At a meeting of the Board of Directors, held June 8, 1885, the following resolutions were, therefore, offered, in grateful acceptance of Mr. Shaw's proposal: —

1. That a School of Botany be established as a special department of Washington University, to be known as the

HENRY SHAW SCHOOL OF BOTANY.

2. That a Professorship of Botany be therein established, to be known as the Engelmann Professorship.

3. That Professor Wm. Trelease, of Wisconsin University, be invited to fill the same; his duties to begin at the commencement of the next academic year, September 17th.

4. That said School of Botany be placed under the special care and direction of an Advisory Committee, to consist of five members, of

whom *two* shall be members of this Board, and *two* shall be selected outside of the Board, — the Chancellor of the University being a member *ex officio*.

This report was accepted and the resolutions unanimously adopted. The record of such action was then submitted to Mr. Shaw and approved by him. Subsequently, by deed of gift, improved real estate was conveyed by the donor to the University, yielding $5,400 per annum, the rental of which from July 1, 1885, has been paid over to the University Treasurer, to be kept, as the whole revenue will always be, separate and apart from all other uses, for the support of the Professorship, and incidental expenses.

Prof. Trelease accepted his nomination, as Engelmann Professor of Botany, and has been actively engaged in his duties since 17th September last.

The special Advisory Committee for the School of Botany has been appointed as follows: —

Mr. Henry Shaw,	Dr. Asa Gray,
Hon. John H. Lightner,	Dr. Geo. J. Engelmann.

The two first named are members of the Board of Directors of the University.

It would perhaps be well for me to stop here and give place to Prof. Trelease; but the name of Engelmann awakens in my mind a reminiscence, connecting the present movement, at least by association, with the infant days of science in St. Louis.

More than forty years ago, five or six young men, of whom I was one, met together, on Main Street, near Chestnut, in the office of the Honorable Judge, Mary P. Leduc. The object was to found an Academy of Science, but not one of our number really knew enough of science to found a primary school, except Dr. George Engelmann, who was an enthusiastic student, especially in botanical research, and who inspired us all with something of his zeal. We organized a society and proceeded to purchase five or six acres of ground, far out of the city, I think near Eighth Street and Chouteau Avenue. There Dr. Engelmann began a botanical garden and arboretum on a small scale. It

was kept up, after a fashion, for some years, but the society faded out and the land was sold, and apparently there was an end of the academy. But under the law of the survival of the fittest, Dr. Engelmann "survived" and became an academy of science in himself. In the midst of professional cares, as a successful and highly honored physician, he made botany his darling pursuit. By correspondence, by contribution of carefully prepared articles for journals of science in this country and Europe, by personally visiting different regions in the West and South, he prosecuted his studies and became known in schools of science everywhere, taking an acknowledged place among distinguished names. So quietly and modestly did he work that few persons in St. Louis knew how much he was doing, but for many years before his decease he had found cordial welcome in the "Missouri Botanical Garden," where his real merit was known and cordially appreciated. It is a pleasant thing for us to learn that his writings, now scattered over the world and inaccessible, will be collected and edited by Dr. Asa Gray and other competent hands to be suitably published, with illustrative plates, a large and costly work, for which Mr. Henry Shaw has generously guaranteed the funds. I also hope that Dr. Engelmann's exceptionally valuable herbariums, the systematic collection of a lifetime, now under the control of his son, will form a part of the accessible riches of the Henry Shaw School of Botany.

Taking into account, therefore, the fact that we have an Engelmann Professorship established, together with other associations already named, may I not justly say that there is a connecting link between those feeble efforts of early days and the larger promise of our present undertaking? Thus giving proof of the universal truth, that no earnest and persistent effort in good work is ever permanently lost.

I have now the honor of introducing to you Mr. William Trelease, Engelmann Professor in the Henry Shaw School of Botany.

THE MAIN TURF WALK.

INAUGURAL ADDRESS.

BY PROFESSOR WILLIAM TRELEASE.

In its conception, the new School of Botany is representative of the spirit of the nineteenth century, the hope of its founder being that it may not only advance the science of botany, but prove useful in the pursuits of practical life to which that science can be made to contribute. To realize this hope, the school should, from the first, be governed with a comprehensive knowledge of the possibilities of botanical work, and a clear understanding of the conditions which favor and oppose it in America, and especially in this great Mississippi Valley, in which we are located.

While it would be premature to make this inaugural a statement of plans, no better opportunity will offer for a consideration of the elements upon which the usefulness of the school must largely depend. Foremost among these is the growing demand for able instruction.

Popular education, and a development of that love of the beautiful in nature which has so long been near the heart of Mr. Shaw, in the creation and maintenance of the magnificent garden and arboretum of which every resident of this favored city is justly proud, are foremost among the objects of the new school which is to enjoy these advantages. I have no doubt this part of our work is more comprehensive than it would at first be thought, by one not a botanist. When the word botany is mentioned, the most common idea that it calls up is — learning the names of plants. A mutual knowledge of plant names is a prerequisite to the exchange of ideas between botanists, and the acquisition of this knowledge is of the greatest importance; yet the study of elementary botany includes much more than this.

In planning educational courses in elementary botany, work of this character cannot be overlooked; yet the time that can be given to a short course in one of the sciences

by undergraduate students is always limited. To best utilize that which is available is a problem that is now engaging the best thought of the most experienced men. At best, the student leaves the class-room with little knowledge; but if his time has been wisely occupied he carries with him a disciplined mind and trained hand with which it can be increased if opportunity offers.

Even the younger botanists recollect the time when systematic botany, and, indeed, that branch of systematic botany which deals with the flowering plants and ferns, was nearly all that was taught in our schools and colleges. What attention was given to the structure and mode of life of these plants was incidental, and mainly taught as a necessary preparation for systematic work. The older persons who followed Eaton or Mrs. Lincoln over this ground, or the younger generation to whom the path has been made easier by Gray and Wood, will agree with me that to a bright student this is fascinating and profitable work. To know the flowers found on a spring or autumn walk as old friends, to call them familiarly by name, and to make each stroll the means of adding to one's acquaintanceship, adds not a little to the pleasure of living. Yet that this knowledge appeals to the emotions in the pleasure it gives, repels some of our unemotional American youth, to whom the study of botany has become somewhat of an accomplishment — a girls' study. I am reluctant to believe that these are, or ever will be, in the majority.

The fact is, nevertheless, patent that the student who is limited to the contemplation of this side of botany, has but a limited knowledge of the subject. Too often, it must be confessed, the name of a plant is all that he cares for. To have the branches of a dichotomous key well in hand, like the leash of a brace of beagles, wherewith to run the unlucky plant he comes across, through numerous turns and windings, to its place in the system, like a timid hare to his burrow, affords a safe and harmless excitement, and forms a necessary part of a botanical equipment; but it is not

strange that the student to whom this is the ultimatum should be sometimes thought lightly of, and his attainments regarded as of little value. The question of time, however, precludes the addition of other subjects to this, if anything like proficiency in any of them is desired, as it should be in any course that is worthy of being taught.

Within a generation a younger school of botanists — younger, but already with graying locks — has sought to avoid the faults of their predecessors by a very different plan of work. So far as the English-speaking world is concerned, this school may be said to date from the organization of the South Kensington courses, under the direction of Professor Huxley. Instead of devoting his time to a class-room study of the theoretical organography of plants, supplemented by the examination, in the laboratory, of the more obvious characters that can be made out by the naked eye or with the aid of a hand lens, the student is initiated at once into the mysteries of the compound microscope, and learns at the start that the yeast we use to raise our bread and the bacteria that swarm in turned broth, are plants. His ideas of the limits of botany are, of necessity, broadened. He is successively carried through the study of representatives of the principal groups of the Vegetable Kingdom, seeing with his own eyes and recording by detailed description and faithful drawings, not only their external characters, but their minute structure. He learns at once how to use the microscope and how to prepare objects for microscopic examination; and the simpler experiments for demonstrating the mode of life — the physiology, of each plant studied, are not omitted.

Let us contrast the students who have respectively followed these two methods. The first has acquired the use of the penknife, the needle and the pocket magnifier. His notion of the Vegetable Kingdom is restricted; but when he sees a flowering plant he knows it or can identify it. More than this, he can generally tell what it is good for. He has, as you might say, a speaking acquaintance with nearly

everything that he recognizes as a plant. The second has acquired more manual dexterity. "A plant" means more to him. His eyes are opened to much in nature that would otherwise have escaped him; but I doubt if he will find more enjoyment in the pursuit of botany after leaving college than the first. He distinguishes a phaenogam from a cryptogam, an alga from a fungus, a schizophyte from one of the Saccharomycetes, by scientific characters; but when he gets into the world, he cannot identify the lower plants for want of a microscope and adequate books; nor, often, the higher plants for want of ability to use the better books at his command.

With a love for microscopic work, and a prejudice in favor of the latter method, I confess to a suspicion that if either must be accepted, to the rejection of the other, the old course, with certain modifications, is the better for a mixed class of beginning students. The nature of these modifications is a subject for study. Besides those features of structure which are essential to their correct identification, there is much of interest that can be learned from an examination of our commonest wild flowers and weeds, even without resorting to the microscope.

In the brief course of evening lectures to which this is preparatory, I shall endeavor to show what a wonderful interdependence there is between plants and certain animals, chiefly insects; and how influential these despised creatures have been in adorning the most beautiful and fragrant flowers with the charms for which we prize them most. The behavior of seedlings during germination, the ways in which some plants climb to the light over the trunks of their more robust neighbors, and the curious habit of others of preying upon insects, are easily studied. These have been called Darwinian subjects. They have occupied the attention of the great naturalist, but they are within the reach of any person with good powers of observation, and tend to strengthen these powers.

There is reason to suppose that in a city with the population of St. Louis, where there is a demand for intellectual pursuits, many persons are to be found who, while not otherwise connected with the University or other institutions of learning, will be glad to profit by the advantages for botanical study that the University is now able to offer. The study of systematic botany is capable of being made more than usually attractive here, where the spring opens early, and the flora is unusually rich and varied; while the treasures of the Botanical Garden, supplementing the wealth of floral forms that occur spontaneously, facilitate the acquisition of a comprehensive knowledge of the families of plants which are likely to attract attention or excite interest. With the coming of fall, the predominance of an entirely different class of vegetation, characterized by the abundance of golden-rods, asters and other Compositæ, changes the aspect of the flora materially, so that the work can very profitably be renewed then where it was interrupted by the heat of summer; nor need it be terminated by the coming of frost, for many exotics bloom largely, or exclusively, during the winter season. The study of ferns and grasses, two of the most interesting groups, is made quite as profitably from dried specimens as from fresh plants, and can be taken up with profit when other material fails. These groups, especially the ferns and grasses, form a most desirable subject for winter study.

While there are circumstances attending the beginning of the new department, which prevent the attempt to organize a class to run through the entire winter, this year, an effort will be made to open a laboratory at once for the study of these groups until the holidays; and provision is being made for the reception of a class in analytical work for the last eight or ten weeks of the college year, for the benefit of all persons who feel an interest in this study, whether connected with the University or not. Such a class need not of necessity be large. The character of its work is to be measured not so much in bulk as in quality; but if I do

not misjudge, the beginning that is made this year will be reasonably satisfactory in its results, while much more can be hoped for when corresponding classes are organized at the end of the next summer vacation.

The study of science must have a beginning. While we may not unanimously agree that this shall be in the kindergarten or the primary school, the reaction that is now succeeding that long period devoted almost exclusively to classical studies, is giving scientific and technical branches a prominent place in even the common schools. This being the case, we desire that the new School of Botany may be useful in adding to the zeal of the large number of teachers in the schools of this city and in the surrounding States who are called upon to teach botanical classes ; and especially in imparting to them the most successful methods of instruction and interesting them in the pursuit of knowledge beyond the limits of the text-book or the schedule.

Within a decade, almost, the word biology — the science of life — has come into general use, yet to-day the better institutions of learning throughout the country vie with each other as to which shall give the most and the most thoroughly disciplinary training in this study of the structure and the life processes of animals and plants. To prepare the student for the practical use of the microscope and the intelligent interpretation of its revelations, and to fit him for advanced work in either vegetable or animal histology and physiology, no better course than this has yet been devised. Laboratory appliances for the most valuable botanical work of this character, and suitable instructional talent, will be provided as one of the first steps looking towards the development of the school.

The world is to-day awake to the desirability — I had almost said the necessity — of scientific training. Especially is this the case on the Continent of Europe, where Germany, in particular, sets an example of national liberality in the encouragement of education in all its branches,

that has not a little to do with the prominent place she holds and is destined to hold in the progress of the world. The recent address of Sir Lyon Playfair, at the Aberdeen meeting of the British Association for the Advancement of Science, shows that England, as represented by its men of broad learning and experience, realizes the advantages of such a system, upon the intelligent and conscientious development of which must largely rest her future. Yet the great British Universities, with the many lower schools that feed them, though inferior to those of Germany, are far in advance of institutions of a similar character on this side the Atlantic.

Aside from its utility in developing the faculties and enlarging the possibilities of enjoying life, the study of any science in its applications to the productive industries commends itself strongly to the reasoning man. Botany is one of the branches of widest applicability in the arts and manufactures.

So large a percentage of drugs and medicines is of vegetable origin, that botany is universally recognized as one of the most important branches in a pharamaceutical education. Notwithstanding great care, many mistakes occur in the collection and sale of drugs. I have in mind several such errors that have been brought to my notice within a few years. In the dried and broken drug, their rectification not infrequently taxes the skill of the expert, while their detection, absolutely required for the prevention of serious accidents, calls for a more than ordinarily thorough familiarity with not only the grosser botanical characters of medicinal plants, but with their minute structure.

The extent to which adulteration is practiced not only in medicines but more particularly in the food supplies which undergo a process of manufacture before coming into the hands of the consumer, renders the services of experts in its detection of frequent demand. The skill and training requisite here are far greater than in the examination of

crude products, since, aside from certain chemical reactions, the characters which must be relied on are determined only by a microscopic study of the suspected material. No part of applied botany is more fascinating, or calls for more intelligent application and thorough training than the study of food substances subject to adulteration and of the adulterants which, from their cheapness or ready attainability, are most frequently employed.

The time which is available for these studies in a school of pharmacy, and the numerous other duties which devolve upon the instructors, usually prevent the student from more than entering upon this field during his connection with it as an undergraduate; while very few graduates are so situated as to return for an advanced course. The duty, not only of employers but of clerks, is to acquire the greatest possible experience in this class of work. To enlist the attention of young men who propose to follow the calling of the pharmacist, should be a pleasant duty to every druggist who has the advancement of his profession at heart; and I have little doubt that, knowing the facilities for training that the School of Botany will offer, many employers in the city of St. Louis will see the wisdom of affording their clerks the command of a certain proportion of their time for its acquisition.

The value of a working knowledge of botany to the medical man has long been recognized, — never more than today. Indeed the science was long a medical science, and its present development is in part directly attributable to the labors of men who, like Dr. Engelmann, — whose loss is keenly felt not only in this, his home, but wherever thorough scientific work is appreciated, — have in their youth acquired the ability and fondness for investigation that in later years have prompted them to devote the odd moments of a busy professional life to the pursuit of a science that they loved.

The physician, no less than the pharmacist, profits by

a knowledge of the plants whose healing virtues he employs. While he may not be called upon so frequently to identify them, a familiarity with the relationships of plants not infrequently furnishes a key to their inherent properties, and is the foundation of the judicious experimental work by which new remedies are being brought into use every year. But to him the science of botany has a far broader significance. One of the earliest discoveries made by the aid of the microscope was that every drop of fermenting fluid, every minutest fragment of putrefying flesh or other organic solid, swarms with living things far too small to be seen by the unaided eye. The theory of spontaneous generation, which has for centuries been the cause of much disputation and many hard-fought battles of argument, having successively been proven untenable for the maggots which so promptly appear in putrefying animal matter, and for the rotifers, worms and infusoria, whose presence can always be predicted in fluids which contain decaying matter of vegetable origin, when exposed to the air, is still believed by many to find its support at or just beyond the limit of the microscope of to-day. Were not the futility of predicting a limit to the perfection of the instrument demonstrated by the failure of similar predictions that have been made from time to time, we might well inquire if the range of enlargement and the clearness of definition that have been attained by Zeiss, Tolles and Spencer, in the construction of their objectives can ever be surpassed; but if the future shall be at all commensurate with the past it is probable that the reading public will, within a comparatively short time, reject the spontaneous generation of the lowest organisms we now know, with as much certainty as they now declare against that of maggots. This theory, stimulating investigation, whatever error it may have been the means of promulgating, has in this way led to the discovery that, paradoxical as it may appear, death is often but a manifestation of life.

The lowest organisms whose life history nas been followed under the microscope, are bacteria. Plants, in their relationships, these minute beings, which are so small that many billions of some of the species could be brought within the space of a cubic inch, resemble animals in so far that they can derive their food only from organic matter; and in doing this they cause some of the most striking phenomena known to science. The decay of a piece of meat or an egg, the souring of a glass of milk, are so familiar to us that we accept them as realities without inquiring as to their cause. Modern science shows that these changes, in short, all that we commonly know as putrefaction or decay, are due to the development within the putrefying substance of myriads of bacteria; the malodorous and poisonous products that accompany decay being merely the waste matter excreted by them.

Bacteria are omnipresent. Wherever the path of a ray of sunlight can be seen in the air of a darkened room they exist. Wherever dust collects they are to be found. Dampness favors their propagation. Drought aids their dissemination. Throughout the universe nothing is more widely distributed, unless it be air. If these agents, small in themselves, but capable in the aggregate of producing so great effects, were confined to dead matter, they might not be entirely without merit. Disagreeable as decomposition may be in many of its manifestations, and harmful as it is in much of our every-day life, much that is worthless and unsightly is rapidly returned by it to begin the round of existence anew. The rancid change in butter may be unpleasant, but without essentially the same change cheese would not ripen from the curd. The souring of cider may please the taste of the veteran only, but without it our tables would be destitute of vinegar. If the results obtained by Schloesing and Muntz are to be accepted, the vegetation of the trees which shade our streets, the flowers with which our parks are adorned, and even the grass on which our cattle feed and the crops upon which we directly

rely for a great part of our food, could not exist were it not for the nitrification of the soil through the agency of certain bacteria. Within the year, no less an authority than Pasteur, in presenting a pupil's paper to the French Academy, which claimed to demonstrate that seeds cannot germinate in a soil entirely free from these microbes, as the French style them, even went so far as to assert that he has long held the opinion that not only the germination of seeds, but many of the functions both of plants and animals, depend upon their presence.

To the physician, the study of bacteria is of more than usual interest. Their history is, unfortunately, not one of benefit alone, nor of simple discomfort. All of them, from their organization, need organized matter for an important part of their food. While the majority of species claim this only after it has become effete, there are some which do not wait for death. A constant warfare is waged against them by all animate creation,—successful in many instances till death from some other cause puts an end to it, but unavailing in others.

The germ theory of disease has been so freely discussed in the public press that it is familiar, at least by name, to nearly every one who reads the daily papers. Nothing is at first thought more startling than the paradox that death from the dreaded zymotic diseases is the manifestation of a lower life within the patient; yet I do not hesitate to say that this is more than probable of many infectious diseases. To name a few is sufficient. Anthrax, small-pox, relapsing fever, and the various forms of pyæmia and septicæmia are of this nature. While the proof is not equally good, for them, diphtheria, erysipelas, typhoid and typhus fevers, yellow fever, and even the too familiar malarial diseases, are believed by able medical men to be germ diseases, and are almost universally treated by the profession on this basis. I do not doubt that consumption and other forms of tubercular disease, together with leprosy and cholera, should fall under the same category, though a perusal of the current litera-

ture shows a strong array of names among the opponents, as well as the supporters, of this proposition. But perhaps the conviction of Pasteur that hydrophobia is a germ disease, capable of being communicated by the microbes of artificial cultures, and, like small-pox and anthrax, preventable, to a certain degree, by a process comparable to vaccination, will be most surprising to the layman.

These are all diseases of man, though several of them are common to, or originate with, the domestic animals, like that dreaded and incurable disease of the horse, — glanders. Others of a similar character are confined to one or another of these animals. As examples, hog cholera, the chicken plague, and the Texas fever of cattle, may be named. The silk interest was at one time threatened with complete destruction by a germ disease of the worms. These diseases, and the list is far from exhausted, are said to result from, or are consequences of, a fermentation of living tissues corresponding to the putrefaction or similar changes which other bacteria cause in dead animal or vegetable matter. A certain class of them, including cholera and typhoid fever, are spoken of as filth diseases, from their frequent dissemination by contaminated drinking water. Certain it is, that the germs of many propagate in filth, and are never far from us; and the frequent insufficiency of quarantine shows how difficult the exclusion of others may be.

To know, so far as he may, the true nature of these germs or microbes, the manner of their development and reproduction, and the conditions of air, sewerage, food, drink and personal intercourse, which favor their propagation, and of the human body which render it susceptible to their attacks, as well as the means of circumventing or destroying them, is the duty of every young man entering the profession of medicine. Chairs of bacteriology are already being established abroad, and liberal sums are placed in the hands of experts for the purpose of investigating the subject of contagious diseases. In this country, lectures on bacteria and the germ theory of disease are given as an addition to

several medical courses, but the time to be spared from the regular curriculum is so limited that the student must usually be content with what can be imparted to him in the class-room, and knows the bacteria of even the commoner diseases only from wall-chart figures and the lecturer's description. While the busy practitioner cannot always find leisure for the use of his microscope, the career of men like Engelmann shows that where there is a will there is a way to do this, as other scientific work, at odd hours, and there are times when knowledge and training such as I speak of may be of value in the treatment of diseases which come under the hands of every physician.

Since this training cannot be given in the medical course, and the young graduate feels the impulse to begin the struggle for a lucrative and useful practice immediately on leaving his *alma mater*, it is clear that it should be provided for in preparatory courses. I do not believe I am promising too much, when I say that an indication that they will be utilized will call forth facilities in the School of Botany for the best work that a class of medical preparatory students are capable of, in the direct examination and cultivation of these microscopic beings which do so much good and work so much ill.

At the close of the war, Congress, realizing the great importance to the country of its agricultural interests, appropriated to the several States large grants of public lands, to endow colleges in which instruction in agriculture and the mechanic arts should be made a leading feature. The general feeling of the public appears to be that little has resulted from these grants, so far as agriculture is concerned. Whether this is true, we need not stop to inquire. The fact that the farmers of the country are discussing the management of the so-called agricultural colleges, that their representatives in the legislative bodies of a considerable number of States have established agricultural experiment stations, and that a movement is on foot to secure from the

national government enlarged means for the furtherance of the work of these stations, is, to one who reads the signs of the times, indicative of a desire to develop the science of agriculture, on the part of those who recognize its importance to the country.

Agriculture and horticulture are so closely related to botany that it is scarcely necessary to mention the dependence of the successful farmer, gardener, fruit-grower or florist, upon an intelligent understanding of, and conformity to, the laws of vegetable physiology in the operations of his every-day life. The nurseryman and florist are, perforce, botanists. To them a general knowledge of systematic botany, and that careful development of the powers of observation which a close study of the characters of plants gives, go far to assure success, when combined with shrewd business tact and a practical familiarity with the manual processes of their vocation.

While the farmer or gardener may require less of this knowledge, he should be well versed in forestry, and familiar with the weeds of the farm and roadside, and the most successful means of contending with them and repressing their advances. The reckless manner in which the most troublesome weeds are scattered from farm to farm, and from State to State, with clover and grass seed, necessitates a knowledge of their seeds, such as can be obtained only by careful study. If planning a course of botanical instruction for young men who intend to make the farm their home, I should give the study of weeds and of our native grasses and forest trees a prominent place in it.

Here, in the Mississippi Valley, the horticulturist contends with climatic conditions unknown in the East, or in the coast countries of Europe, whence we have received many of the valued varieties which we are trying — often in vain — to cultivate, as well as the methods of treatment by which we struggle for success. The coming fruit-grower must rely upon the teachings of botanical geography in the selection of varieties, and upon a most exact understanding

of the best methods of breeding and selecting new races of hardy parentage, if he would advance to that success which is ultimately hoped for in this changeable and severe climate. That the Missouri Botanical Garden and the School of Botany may be of the greatest utility in the development of this great home-creating and home-beautifying interest, is the expressed wish of their founder.

A subject still in its infancy in this country, and, indeed, but little advanced abroad, is that of plant disease. In the absence of reliable statistics, it cannot be said how great the aggregate loss from smut, mildew and similar causes is; but it must reach into the millions annually, in a country whose agricultural interests are so great as those of the United States. What a saving it would be if only a tithe of this loss could be prevented!

The study of plant diseases is botanical in more senses than one. Not only does a knowledge of vegetable physiology underlie it, but the most destructive diseases are, almost without exception, caused by parasitic plants of low organization.

Blight of the pear and apple is attributable to the growth of certain bacteria, which destroy the trees while feeding upon the starch contained in the young growth made by them. To barely enumerate the rusts, smuts, mildews and rots of our most valuable crops, would prove wearisome and would make an appalling list. Suffice it to say that nearly all are fungi. To rightly understand their nutrition, growth and propagation, and the varied forms in which many of them appear, when fruiting, is a long step toward controlling them and lessening their ravages. The grape mildew and rose mildew, now that their natural history is understood, are no longer the dreaded foes that they were a quarter of a century ago, and every educated gardener understands how to proceed to hold them in check. That they are superseded by more deadly and less tractable fungous diseases, should be but a stimulus to further study. No branch of botanical science is more enthusiastically

undertaken by advanced students of a practical turn of mind, than that relating to these parasites. Fortunately, or unfortunately, as you choose to regard it, these organisms are to be found in abundance about us, and, with a good library, we are now prepared to pursue this study to advantage.

Technical training is not complete without a knowledge of certain branches of botany. The engineer who is engaged in pioneer work must, of necessity, be well versed in forestry. To understand the manipulation of the microscope, and by its aid to recognize the innate cause of the difference between good and bad timber, adds intelligence to his work. The decay of timber, like the disease and death of plants, is usually the result of the insidious attacks of certain fungi, which destroy its structure in building up their own. Knowledge of the means of holding these destroyers in check, rests fundamentally upon an understanding of their life history and of the conditions which are favorable and inimical to them. We look, too, with some expectation, to direct botanical returns from a greater recognition of this department of science in technical training or, perhaps it would be better to say, preparatory to technical courses; for the young engineer or surveyor is not infrequently called by his duties into regions that are difficult of access, and have been but imperfectly explored botanically, and, knowing the simple means of preserving specimens for the herbarium, he is often in a position to render good service to the cause of science. Many most valuable collections have already been made by persons attached to surveying and exploring expeditions; but much still remains to be done in the less accessible parts of the country.

The immediate value of botanical knowledge to the explorer has been often demonstrated in the evil consequences that have attended the use of noxious plants under the impression that they were edible; and plants that are mild

and nutritious have quite as frequently been allowed to go unused, from ignorance, when wholesome food has been much needed.

The relation of botany to the fine arts need not be dwelt upon further than to say that some of the most attractive decorative designs are obtained from leaves, flowers and fruit. The prevalent tendency toward naturalism in decorative art finds encouragement and elevation in the close study of flowers and foliage that is made in the laboratory ; while the minute structure of the higher plants, and the vegetative and reproductive organs of many of the cryptogams, as viewed under the microscope, suggest untold combinations of new features, of surprising elegance and beauty. In true art, even more than its practical applications, a familiarity with detail is often essential to success; and the artist whose landscapes and forest studies fail in fidelity in their presentation of the habit of trees, cannot hope for success in this direction, however brilliant he may be in execution. What an accurate knowledge of anatomy is to the painter of the human figure or of animals, a working familiarity with the bark, spray and leaf forms of trees is to the still-life student.

In the directions that have been thus imperfectly outlined, I have endeavored to show how broad the field for botanical instruction is, and it is not difficult to single out those lines which promise to result in much good if faithfully prosecuted. But instruction is by no means all of education, and far from all of university life proper ; and it must not be forgotten that the School of Botany is organized as a University branch. To quote again from the address of Sir Lyon Playfair: —

> Universities are not mere storehouses of knowledge; they are also conservatories for its cultivation. Professors in a university have a higher function, because they ought to make new honey as well as to store it. The widening of the bounds of knowledge, literary or scien-

tific, is the crowning glory of university life. * * * Unless colleges have such ambition, they may be turned into mere mills to grind out material for examinations and competitions. Higher colleges should always hold before their students that knowledge, for its own sake, is the only object worthy of reverence. Beyond college life, there is a land flowing with milk and honey for those who know how to cultivate it.

Without fear of more than temporarily displeasing the patriotic American, whose pride of country is second to that of none, it may be said that Germany, with its usual zest in educational matters, leads the world in the quantity and quality of original work done by properly prepared students in her universities. I fear that it may be many years before we can hope for, much less claim, equality on this side the Atlantic, though the phenomenal progress which the Johns Hopkins University has made in the establishment of popular and productive post-graduate departments warrants the greatest caution in making such a prediction. The avenues to successful business or professional pursuits are open earlier to the American than to the citizen of an old-world country; and there is far less of the leisure for further study and improvement that attends the patient waiting for an opening in life that is required of the German youth. Positions of trust, even the judge's bench and the professor's chair, often come unsolicited with us, when the incumbent should, and, were it not for the temptation before him, would occupy the position of a learner.

It has been said by one of America's most accomplished specialists, that the great need of American science is educated specialists, — men who, on the foundation of a liberal education, have reared that superstructure of training in the technique and literature of the specialty they espouse which shall equip them for the performance of rigidly accurate investigation; and that mental discipline and knowledge that shall enable them to comprehend and apply with a large understanding, the result of their labor. To be instrumental in training such specialists, and to assist them in doing original work, should be the highest aspiration of a teacher; to do it well, is the greatest service that he can render.

Many colleges offer courses of instruction for undergraduates and for graduate students that we may profitably copy to a greater or less degree in planning our work. In not a few, the value of original research on the part of both students and teachers is fully recognized. But the chair of botany in most American colleges is combined with some other department — frequently more than one — and, under the pressure of other and imperative calls for money, it is usually but feebly supported, and is developed only to the extent to which it is useful in the undergraduate courses. This renders the training of advanced students possible in few instances, while the opportunities for original work are often meager. Thanks to the far-sighted liberality of Mr. Shaw, we shall be able to provide the library, material, and laboratory appliances for work of this nature as they are needed.

Popular judgment of the new school must, of necessity, be based largely upon the success of its popular classes. Even with abundant resources, securing the necessary facilities for advanced work is a matter of time; and, if measured by their quantity alone, the results are not striking. No one who has not himself done original work can appreciate the slowness with which results are reached; — the amount of time consumed in preparing for a series of examinations or experiments, in tracing back the literature of the subject, and in controlling and verifying results; — all of which must of necessity be done, although not the investigation proper. To do this presupposes the possession of a more than good library, and of extensive collections — living, pressed, and preserved in alcohol. These must usually be accumulated gradually, as opportunity offers, without reference to present needs, or they are not available when the occasion for their use comes. It is the possession of these facilities, quite as much as the instruction of leaders in science, that tempts the American graduate abroad if he has the ambition to do work in some special direction after leaving college.

A knowledge of what has been done in American botany and a recognition of a part of that which has not been done, together with a study of the tendencies of the times, may not be without value in forming our plans for advanced instruction, as well as that of a more elementary character. It is especially necessary for the former, that we may avoid a waste of energy on that which has already been well done. It has been wisely said that "a reaper cannot expect to cut a full swath, following in the track of another," though the opportunity for the gleaner is far from discouraging in any field of study or research.

Systematic botany so far as the flowering plants of Europe and North America are concerned, is far from being a *terra incognita*, and if, as all botanists pray, Dr. Gray shall be spared to complete his Flora of North America, our entire country will be nearly as well provided for as the Eastern States now are in the Manual, or the Southern States in Chapman's Flora. Yet it must be long before we can hope for a work comparable with Watson's English Topographical Botany, the production of which must result from a faithful study of local floras over the entire country. The study of cryptogams or flowerless plants, as a branch of systematic botany, is still largely to be made. It is more than half a century behind that of the flowering plants; and the multiplied synonymy of American fungi is the strongest argument for increased facilities for training those who are to make this study their life work.

I have already spoken of the value of a knowledge of the life history of these plants in commenting upon the practical applications of botany. To teach what is already known is the smallest part of imparting this. The same remark may be made with equal truth of the physiology of all plants, and of their minute structure as connected with their vital processes. Properly developed, I see in these directions the greatest usefulness in the prosecution of advanced and independent research that this or any American school of botany can aspire to.

To conscientiously further the study of botany in all useful directions, to the extent of my ability and means, is the only pledge of success that I can give. That the many friends of the Shaw School of Botany may see their hopes and mine realized, depends in no small degree upon their own exertions. To give us students who are prepared to do good work and whose ambition is to do their best, to extend the hand of encouragement when progress seems slow and the way hard, and at all times to kindly criticise errors of judgment and execution, is as much their duty as it must be their pleasure. Above all, I would ask that adverse criticism, leading to a loss of confidence, be not hastily passed upon the slowness of growth that is, from the nature of the case, to be expected in much of our undertaking. The oak does not reach its strength and majesty in a night, nor does the mushroom ever attain to the stature of the oak.

At the conclusion of Professor Trelease's address, the following resolution was offered for adoption by the Directors and Faculty of Washington University, and by the audience assembled: —

Resolved, That as friends of advanced education, and as citizens of St. Louis, we gratefully recognize the long continued benefactions conferred by our fellow-citizen, Mr. Henry Shaw, and especially at this time thank him most heartily for his generous action in the cause of scientific study and research. That he may live many years to see the fruit of his labors, and that his last days may be his happiest and best, is our earnest hope and prayer.

The resolution was adopted unanimously by a standing vote.

REPORT ON THE SCHOOL OF BOTANY.

SUBMITTED TO THE DIRECTORS, JUNE 3, 1890.

To the Acting Chancellor
of Washington University:

In completing the fifth year's work of the School of Botany established by the late Henry Shaw, it has seemed to me wise to submit to you the following report and suggestions concerning the School, for presentation to the Board of Directors of the University.

Established in June, 1885, the School of Botany was at once placed under my direction by the late Chancellor of the University, and formally opened on the 6th of November following, by inaugural addresses by the Chancellor and myself.

During the five years since its organization, the School of Botany has supplemented the Undergradute Department of the University by giving to matriculated students such instruction in botany as could be arranged for, either as required studies or electives in the regular courses of study prescribed by the University Faculty. Until the present year, when an unusual amount of work has made it necessary for me to assign one elective to an assistant, this instruction has been given entirely by myself. The amount of time which it has been found practicable to spare for such work from the undergraduate courses has necessarily been small, and the maximum that has yet proved feasible with undergraduate students, consists in two exercises per week, continued through the Junior and Senior years.

This has made it possible to arrange classes for persons wishing to do work in botany, but not connected with the Undergraduate Department of the University; and the

A PORTION OF THE PARTERRE.

inauguration of the School of Botany was followed by the immediate organization of a class for the study of grasses. Similar classes in one or more lines of botanical study have been formed in the fall and spring terms of each succeeding year. None of these classes has been large. Sometimes only one or two persons have presented themselves for a given course. But it has been thought best to proceed with even very small classes when there was an earnest desire on the part of applicants to do such work as lay within the scope of the school; and a standing announcement is made in the catalogue of the University, that classes for either day or night work will be formed in any branch that can be taught with profit, on the application of six persons. Frequently, however, as has been said, classes are organized for a smaller number than this.

In 1888, largely through the interest of Drs. W. T. Porter and A. N. Ravold, a class of young physicians residing in the city, was formed for the study of bacteria in their connection with medical practice; and a portion of that summer was spent by me at the Berlin center for such work, where the necessary apparatus and cultures were obtained for the equipment of a bacteriological laboratory. This has been successfully operated for two winters, with evening classes; but the demand for such instruction is so small, and the medical schools of the city are now so well equipped for such work, that it has been decided to discontinue this elementary work for the present, although it is hoped that ultimately the School of Botany may afford opportunity for special research in this direction.

In addition to the work done with special laboratory classes, nearly all of which have been conducted by myself, two courses of evening lectures have been given in the lecture hall of the University, — one on the pollination of flowers, the other on the dissemination of plants. While the attendance was not large on either, a

gratifying degree of interest was manifested by those who were present.

In the performance of the necessary routine work of the School, and to a small extent in the instruction given to general classes, I have been very efficiently aided by Mr. L. H. Pammel, who spent nearly three years as my assistant, and was called to the chair of botany in the Iowa Agricultural College in the spring of 1889. Professor Wm. T. Porter, of the St. Louis Medical College, and Dr. A. N. Ravold, who has recently been given charge of the bacteriological work of the same institution, have given much gratuitous service in the bacteriological laboratory already referred to.

Owing to the limited income of the School of Botany for the past two years, and the necessity of soon meeting a considerable insurance premium payable on its endowment building, no effort has yet been made to fill the vacancy caused by the resignation of Mr. Pammel in 1889, such assistance as has been needed being given by Mr. A. S. Hitchcock, First Assistant at the Garden, who is detailed for partial service under direction of the Trustees of the Garden; but with the opening of the next college year, it is hoped that the school may once more claim the entire time of a competent assistant.

One of the most important features of the work of a University department is properly held to be original study; and the rather small amount of class-room work that has proved practicable in the School of Botany has permitted my assistant and myself to devote some time to such study. It was my good fortune to be associated with the late Professor Gray during the winters of 1885–6 and 1886–7, in editing the collected botanical writings of the late Dr. George Engelmann, published in an appropriate form by Mr. Shaw. During my stay in Cambridge for this purpose, opportunity was found for the study of certain groups of North American plants, and similar work has since occupied all of my leisure, and was pursued during one vacation

spent near several of the principal herbaria of Europe. The results of this work appear in a series of papers published in the Transactions of the St. Louis Academy of Science and the proceedings of other learned bodies, and the botanical press. During his connection with the School of Botany, Mr. Pammel was entrusted by the experiment station of Texas with some important field-work, which, I believe, was very satisfactorily performed, and has formed the basis of one or more official reports; and he also found opportunity to do several other pieces of good work, the results of which have been embodied in papers published by the Academy, and the botanical and agricultural press of the country.

Foreseeing that from time to time work of some interest might be expected from the School, I began in 1887 editing a series of "Contributions from the Shaw School of Botany," which are published in the Transactions of the Academy or elsewhere, and of which a limited number of separate copies are reserved, with the intention of issuing them to prominent botanical libraries when enough shall have appeared to make it desirable to bind them together in a single volume, thus ensuring their preservation and accessibility for use by specialists. Up to the present time six papers of this series have been printed, and others are in preparation.

Realizing very fully the slowness with which scientific work is accomplished, I feel that small as the results in this direction are, they are all that could reasonably have been anticipated; and the added facilities now offered by the Botanical Garden render it probable that in the future no small amount of useful work may be looked for from the instructors and advanced students of the School of Botany.

Owing to the lack of available accommodations at the Garden, where such provision ought to have been made, I was forced, on assuming charge of the School of Botany, to lay the foundation for a general herbarium at the laboratory of the School. This collection is based on the

remnants of my own phænogamic herbarium, presented to the School when I first came to St. Louis, to which have been added:—

The herbarium of the late Dr. O. Krause, of Jefferson City, found at the University addressed to me, but of the history of which diligent inquiry has revealed nothing. This includes, approximately, 2,000 specimens.

2. A set of New Zealand ferns, presented by Professor H. S. Pritchett.

3. A set of 161 Australian plants, presented by Baron von Mueller.

4. About 600 sheets of duplicate specimens from the herbarium of J. Gay, distributed from Kew, and obtained through the interest of Dr. Gray.

5. About 6,000 specimens from the duplicates of the Joad herbarium, likewise presented by Dr. Gray, and originally distributed from Kew.

6. A collection of some 400 Mexican plants made by Dr. Edward Palmer, and presented by him.

7. A partial set of Professor E. L. Greene's Santa Cruz Island plants, presented by the collector.

8. A set of Jamaican ferns, presented by Mr. J. Hart, now of the Royal Gardens of Trinidad.

9. About 200 Californian plants, presented by Mr. S. B. Parish.

10. A set of Howell's Oregon collection of 1887, purchased.

11. A set of Bailey's *Carex* exsiccatæ, purchased.

12. A collection of alpine plants, made by myself in Colorado in the summer of 1886.

13. About 6,000 sheets, being all that remains, of the original herbarium of the late S. B. Buckley, collected in the South Atlantic States, and purchased of the late Mrs. Rebecca Mann Dean, in whose possession it had been for many years.

14. About 700 specimens of Iowa plants, presented by Mr. A. S. Hitchcock.

15. Collections of smaller size, but often important, and

aggregating many hundred specimens, donated by L. H. Pammel, F. S. Earle, Prof. W. R. Dudley, Dr. Aug. Gattinger, C. W. Kempton, J. Q. A. Fritchey, Dr. George Vasey, the Secretary of Agriculture, Mrs. F. W. Wislizenus, Mrs. Katherine Brandegee, Dr. Chas. Mohr, Miss Frances Prince, Dr. J. Schneck, F. W. Anderson, the Director of the Kew Gardens, Dr. C. C. Parry, Mr. Edwin Harrison, M. Alfred Wesmael, Prof. S. M. Tracy, F. M. Boynton, Rev. A. B. Langlois, Prof. John Macoun, and many other correspondents.

This herbarium, now aggregating about 20,000 mounted sheets of flowering plants and ferns, is increased by some 4,000 numbers of cryptogams, including Von Thuemen's Mycotheca, Ravenel's own copies of his Fungi Caroliniani and Fungi Americani, several centuries of Berkeley's British Fungi, etc. As has been stated, it is a collection more properly maintained by the Garden than the School of Botany, and it is already far too valuable to be kept in so unsafe a building as that now devoted to the School of Botany. For these reasons, and in view of the very intimate relations established by their founder between the School of Botany and the Missouri Botanical Garden, and now cemented by the mutually helpful steps that have been taken by the Directors of the University, and the Trustees of the Garden, I would respectfully recommend that the Directors of the University authorize me to propose to the Board of Trustees of the Garden that this collection may be placed at the Garden as a nucleus for the important general herbarium to be accumulated there, on condition that the School of Botany be reimbursed for expenditures for paper, alcohol, etc., used in mounting the specimens properly. In making this recommendation, I feel that the best interests of science will be subserved by the proposed action, and that the School of Botany will always find the collection as accessible as though it were in its own possession, while the safety and general usefulness of the specimens will be greatly increased.

Should this recommendation be favorably acted on, and the proposed donation be accepted by the Trustees of the Garden, I propose in future to confine the energy of the School, in this direction, to the completion of its local herbarium, which now numbers some 1,600 sheets, and of an already considerable collection of woody plants in their winter condition, which is being formed as the basis of scientific work now under way at the School.

The instrumental and other equipment, and the exact nature of the educational work, of the School of Botany, are so fully indicated in the Annual Announcement of the School, and in my report for 1889 to the Trustees of the Botanical Garden,* that it is unnecessary to say anything on that subject in this place.

Respectfully submitted,

WM. TRELEASE,

Professor in Charge.

ST. LOUIS, MO., June 3, 1890.

The action recommended with reference to the general herbarium of the School, was unanimously taken by the Directors of the University, and their donation accepted by the Trustees of the Garden, so that the collections referred to are now the property of the Garden and located with its other herbaria.

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* See page 99, *infra*.

THE MISSOURI BOTANICAL GARDEN.

FIRST ANNUAL REPORT OF THE DIRECTOR, FOR 1889.

SUBMITTED TO THE TRUSTEES, JAN. 14, 1890.

To the Trustees of the Garden:

In accordance with the rules and regulations of the Board of Trustees, I respectfully submit the following report on the condition and prospects of the Botanical Garden, and of the School of Botany therewith connected.

On assuming control of the Garden, on the 12th of September last, I found that much work was necessary to place many parts of the establishment in repair so as to insure their preservation; and for this reason, as well as to secure the completion of unfinished work of various sorts, a much larger force of laborers has been employed during the winter than has been customary, the unusually open season rendering it possible to continue out-of-door work without interruption up to the present time. As a result of the work already done or now under way, the garden and its surroundings will by the opening of the next season be in unusually good repair, though there will still remain many things needing attention in the near future.

Very much of the ground occupied by the garden is wet and spongy, owing to a stratum of clay not far below the surface. To put it into the best condition for cultivating plants that are desirable for the grounds, and, incidentally, to preserve many of the coniferous trees now growing, extensive draining, in addition to that done during the life of Mr. Shaw, is an imperative necessity. Some of this work has already been done, but much remains for the future.

Some of the hedge-rows in the garden, in bad order, or composed of undesirable shrubs, are being gradually replaced by new plants of suitable varieties. For the most

part, the present arrangement of the grounds will be maintained, as representing Mr. Shaw's ideas; but with the opening of spring, one or two innovations will be made, which it is believed will render the garden even more attractive to the citizens of St. Louis, and visitors from a distance, than it has been heretofore.

While the will of Mr. Shaw, under which the Trustees of the Garden act as such, provides that the grounds shall be closed to the public on holidays and Sundays, excepting the afternoon of the first Sunday each in June and September, it has been thought that many people would appreciate the privilege of enjoying the garden during the long summer evenings; and to this end, it has been decided to extend the time of closing until half an hour after sunset, although taking this step has involved the employment of additional help, as well as other measures which it had not been thought expedient to adopt in the past.

As far as possible, restrictions upon the public have been avoided, and the small charge formerly made for the care of parcels at the gate, has been done away with. But for the protection of the grounds, and the comfort of visitors, the following regulations (substantially the same as those in force during Mr. Shaw's life) have been adopted and posted for the guidance of the public, and will be enforced: —

The garden is open to the public free of charge daily (holidays excepted) from 8 a. m. until half an hour after sunset. It is closed on Sunday, excepting the first Sunday each in June and September, when it is open from 2 p. m. until sunset.

The offices, herbarium, library, and private greenhouses, are open only to authorized students, or persons having business with the Director or Head Gardener.

Lunches, baskets, satchels, and parcels of every description, must be left outside. If small, they may be cared for by the Gate-keeper, who will make no charge for her services.

Visitors are particularly requested not to handle specimens, nor to pick flowers, fruit, or leaves, or in any way mutilate or deface any plants or other property in or about the grounds.

Intoxicated or disorderly persons will be refused admittance.

Smoking is not allowed.

Any infringement of these regulations, or any discourtesy on the part of employees of the garden, should be at once reported to the Director.

The object of the steps indicated above, is primarily to preserve and improve the garden as a means of contributing to the pleasure and instruction of the citizens of St. Louis and their guests, to whom the garden has always been an object of attraction. But this is only one of several objects contemplated and provided for in the will of Mr. Shaw; and on assuming the responsibility left to them, the Trustees of the Garden adopted the following broad outline for the guidance of the Director in planning and carrying on the work assigned to him: —

1. To continue or even augment the present ornamental features of the garden.

2. To add to its botanical usefulness and interest by the introduction, as opportunity offers, of plants representative of the American flora, so that, other things being equal, these shall ultimately be largely represented and may even preponderate outside of the greenhouses, giving, then, in the garden, an epitome of the leading characteristics of our native flora.

3. To carry into execution, as rapidly as possible, a system of correctly naming and labeling all plants in the garden, with the exception of such as may be used in ribbon-gardening or for other exclusively ornamental purposes.

4. To provide fire-proof quarters for the invaluable herbarium of the late Dr. George Engelmann, and to immediately mount it in the proper manner, so as to insure its preservation and availability for scientific use. Also, to provide for and add to the general herbarium (based on that of Bernhardi) now at the garden, with the special object of ultimately making it complete in good representatives of American plants.

5. To arrange, bind, and index the books and pamphlets at the garden. Also, to provide more ample but equally safe accommodations for the library, to bring it up to date as rapidly as possible, to enter subscriptions for periodical publications, and to keep it abreast of the times, and in the most useful form, by the purchase of important publications as they shall appear, and by the proper indexing of periodicals and pamphlets.

6. To secure a botanical museum, containing material needed for study or calculated to advance general or special knowledge of botany.

7. To direct the main energy of research for the present toward assisting in the completion of a systematic account of the flowering plants of North America, by the publication of monographs of different Orders and Genera, illustrated when this may seem desirable; and to specially cultivate representatives of such groups for purposes of study.

8. To gradually acquire and utilize facilities for research in vegetable histology and physiology, the diseases and injuries of plants, and other

branches of botany and horticulture, as special reason for developing one or the other may appear.

9. To make the facilities of the garden useful in botanical and horticultural instruction, as they increase and opportunity for such work appears: meantime, in all feasible ways, to attract to the School of Botany students of promise, and to provide for their instruction and the best use of their time as investigators.

10. To take steps looking to the early appointment of six "garden pupils," — youths with at least an elementary English education, who shall be regarded as apprentices in the garden, working under the direction of the head gardener and foremen, and shall hold scholarships yielding $300.00 per year each, together with free lodging near or in the garden, and free tuition in the School of Botany; and who, after having worked for six or more years (as shall ultimately prove best) in the different departments of the garden, and proved proficient in its practical work, may be admitted to examination for a certificate of proficiency in the theory and practice of gardening.

11. To have in mind, in appointing associates for the Director, their special aptitude in some one of the branches indicated above, so that with each appointment the efficiency of the institution for instruction and original work may be broadened and increased.

One of the most practical and directly useful of the steps indicated in this policy, is the provision of scholarships for garden-pupils; and for this reason, it has been one of the first to receive attention. Under authority from the Board, the following announcement concerning such scholarships was issued early in December; and while the step is quite experimental, it is hoped that suitable care in carrying out its provisions may produce good results in the training of thoughtful and well-read gardeners.

In accordance with the intention of its honored Founder, the Trustees of the Garden propose to provide adequate theoretical and practical instruction for young men desirous of becoming gardeners. It is not intended at present that many persons shall be trained at the same time, nor that the instruction so planned shall duplicate the excellent courses in agriculture now offered by the numerous State Colleges of the country, but that it shall be quite distinct and limited to what is thought to be necessary for training practical gardeners.

To this end, the following resolution was adopted by the Trustees, at a meeting held on the 19th of November, 1889: —

"*Resolved*, That there be established the number of six scholarships for garden pupils of the Missouri Botanical Garden, to be available on and after April 1, 1890, such scholarships to be awarded by the Director of the Garden on the results of competitive examination, except as here-

inafter provided, to young men between the age of 14 and 20 years, of good character and possessing at least a good elementary English education; each scholarship to grant such privileges and be subject to such conditions as are provided below or may subsequently be provided by the Trustees of the Garden.

"Until otherwise ordered, two such scholarships shall be reserved for candidates to be named by the State Horticultural Society of Missouri, and the Florists' Club of St. Louis, respectively; provided, that such candidates shall be given scholarships only after passing satisfactory preliminary examinations, and shall be subject after appointment to all tests and regulations prescribed for other candidates and pupils, and that if the names of such candidates are not presented by the societies designated, within sixty days after such action is requested by the Director, the vacancies may be filled by him on competitive examination, as in other cases.

"Each scholarship so conferred, may be held by the original recipient for a period not exceeding six years, subject to the following conditions: —

"Each garden pupil shall be required to lead a strictly upright and moral life, and shall be courteous and willing in the performance of all duties prescribed for him. He shall devote his entire time and energy to the labor and studies prescribed for him, except that from time to time he may be granted leave of absence to visit his home or for other good reason, at the discretion of the Director, provided that the aggregate of such absences in any calendar year shall not exceed thirty days. He shall also show such ability in his work and studies as to satisfy the Director that it is advantageous for the scholarship to be held by him; and from time to time he may be subject to both theoretical and practical examinations, or may be given special tasks calculated to test his knowledge or resources. Failure to meet the requirements in any one of these respects, making due allowance for extenuating circumstances, shall forfeit all claim on any scholarship, which may then be awarded to another person in the prescribed manner.

"Garden pupils, appointed as above indicated, shall be regarded as apprentices in the Botanical Garden, and as such shall be required to work in it under the direction of the Head Gardener, performing the duties of garden hands. They shall be successively advanced from simpler to more responsible tasks; and in such order as may seem best, shall be transferred from one department of the Garden to another, until they shall have become thoroughly familiar with the work of all.

"To the end that garden pupils shall be repaid for their services to the Garden, and that the absence of pecuniary means need not deter any young man from obtaining such training as is contemplated, each regularly appointed garden pupil holding a scholarship shall be entitled to the following wages, payable in equal installments at the end of each fortnight: For the first year, $200.00; for the second year, $250.00; and for each year after the second, $300.00; together with plain but comfortable lodgings convenient to the Garden.

"In order that they may have opportunity to become instructed in the theoretical part of their profession, and in subjects connected therewith, such pupils shall not be required to do manual work in the Garden for more than five hours per day after the first year, devoting the remainder of their time to the study of horticulture, forestry, botany, and entomology, under the direction of the Director of the Garden; and they shall for this purpose be granted free tuition in the School of Botany of Washington University. They shall also receive practical instruction in surveying and book-keeping, so far as a knowledge of these subjects is held to be necessary for a practical gardener charged with the management of an estate of moderate proportions.

"At the expiration of six years, the holder of a scholarship, who is recommended as practically proficient, shall be entitled to examination by the Garden Committee, in the subjects prescribed for study, and on passing such examination to the satisfaction of the Committee and Director, he shall receive a certificate of proficiency in the theory and practice of gardening, signed by the Chairman of the Garden Committee and the Director of the Garden. In exceptional cases, candidates may be admitted to examination at the end of the fifth year, when this shall be deemed advisable by the Garden Committee, and on passing such examination satisfactorily, shall be entitled to a statement to that effect from the Director, and to the regular certificate on the subsequent completion of a year's work to the satisfaction of their employers."

All applicants for scholarships, whether named by the societies indicated above or not, will be examined in the following subjects, so far as they are taught in the upper classes of grammar schools: English grammar, reading, writing, and spelling; arithmetic; and geography. If the number of candidates for scholarships exceeds the number of scholarships to be awarded at any time, all candidates except those named by the societies indicatod, will be required to pass a further competitive examination, which will cover history of the United States, English literature, algebra, German, the elements of botany, zoology, and physiology, and such other subjects as may from time to time be prescribed. It is not intended to make the passing of examinations in these last-named branches a requirement for the award of scholarships, but merely in this way to obtain a means of selecting the most deserving and able candidates when it is necessary to reject some. Hence, the Director will always use his discretion as to the importance to be attached to greater or less proficiency in any of the subjects covered by competitive examinations, as well as to the other qualifications of candidates admitted to such examinations.

Under the above provisions, the following announcement is made:—

Scholarships, not exceeding six in number, will be awarded by the Director of the Garden, prior to the first of April next. In case the entire number are not then awarded, the remainder will not be awarded until the corresponding period of the following year, and vacancies which may subsequently arise will be filled annually, after published announcement.

LODGE FOR GARDEN PUPILS.

Applications for scholarships, to receive consideration, must be in the hands of the Director not later than the first day of March. The preliminary examination for all candidates will be held on Tuesday, March 4th, at the Shaw School of Botany, 1724 Washington avenue, St. Louis, between 10 a. m. and 5 p. m. If the number of applicants exceeds six, competitive examinations, based on the subjects indicated above, will be held at the same place on Friday and Saturday, March 7th and 8th.

Candidates who live at places remote from St. Louis, and who wish to be spared the expense of coming to the city for examination, may send with their application, the name and address of the principal of the nearest high school or of some approved private school, in case he is willing to take charge of such examination for them; but all applications of this character must be in the hands of the Director not later than the middle of February. If the examiner is approved, papers will be sent to him before the date set for the examination, and on the payment of a fee of $2.00 to him, the candidate may write on them in his presence. If competitive examinations are also required, the same examiner will receive the papers for them in time to submit them to the candidate on the date set for similar examinations in St. Louis, on receipt of an additional fee of $3.00 as a partial payment for his time in conducting the examination. The papers written on such examinations will be forwarded by the examiner to the Director, who will read them in connection with those written in St. Louis, before making any awards.

Successful candidates will be started in their duties as garden pupils on Tuesday, April 1st, at the Botanical Garden. They will be lodged in comfortable rooms in a spacious dwelling adjoining the Garden, under the charge of the Head Gardener or some other competent person. It is not the intention of the Trustees to furnish table board, but good board can be obtained in the lodging house or elsewhere, at the usual cost. The lodging house will include a reading-room supplied with the more valuable horticultural and agricultural papers, and also with a small but standard collection of books on the same subjects, which the pupils will have free use of. So far as possible, the surroundings of pupils will be made homelike, and without assuming any responsibility for their behavior, an effort will be made to subject them to influences calculated to insure for them gentlemanly manners and habits of industry and investigation.

During the first year of their scholarship, garden pupils will work at the practical duties of the Garden nine or ten hours daily, according to the season, the same as regular employees of the Garden, and will also be expected to read the notes and articles referring to the subject of their work, in one or more good journals.

In the second year, in addition to five hours' daily work of the same sort, they will be given instruction and will be required to do thorough reading in vegetable gardening, flower gardening, small-fruit culture, and orchard culture, besides keeping the run of the current papers.

In the third year, in addition to five hours of daily labor, they will be

instructed and given reading in forestry, elementary botany, landscape gardening, and the rudiments of surveying and draining, and will be required to take charge of clipping or indexing some department of the current gardening papers for the benefit of all.

In the fourth year, besides the customary work, they will study the botany of weeds, garden vegetables, and fruits, in addition to assisting in the necessary indexing or clipping of papers, etc., and will be taught simple book-keeping, and the legal forms for leases, deeds, etc.

The course for the fifth year, in addition to the customary work, will include the study of vegetable physiology, economic entomology, and fungi, especially those which cause diseases of cultivated plants; and each pupil will be expected to keep a simple set of accounts pertaining to some department of the Garden.

In the sixth year, in addition to the manual work, pupils will study the botany of garden and green-house plants, of ferns, and of trees in their winter condition, besides the theoretical part of special gardening, connected with some branch of the work that they are charged with in the Garden.

From time to time, changes in this course will be made, as they shall appear to be desirable, and the effort will be made to give the best theoretical instruction possible in the various subjects prescribed; but it is not intended to make botanists or other scientific specialists of garden pupils, but, on the contrary, practical gardeners.

Applications for scholarships, and any inquiries regarding them, are to be addressed as below, on or before the dates mentioned above. If requested, blanks will be mailed to persons who contemplate making application.

WILLIAM TRELEASE,
Director of the Missouri Botanical Garden,
St. Louis, Mo.

The intimate relations established by Mr. Shaw between the Garden and the School of Botany, when the latter was created, have been recognized and strengthened by the action of the Directors of Washington University, who have granted free tuition in this department to garden pupils who may be given scholarships; and by the action of the Trustees of the Garden in authorizing the Director, under certain restrictions, to detail persons in the employ of the garden to give assistance in the School of Botany, and to supply from the garden, material needed for purposes of instruction and study in the school. The following general statement concerning the School of Botany, is extracted from the latest catalogue of Washington University: —

HENRY SHAW SCHOOL OF BOTANY.

ESTABLISHED JUNE 8, 1885.

Advisory Committee: — The Chancellor of the University, *ex officio*, Henry Shaw,* John H. Lightner, Wm. G. Farlow, M. D., Geo. J. Engelmann, M. D.

Instructors: — William Trelease, Engelmann Professor of Botany, A. S. Hitchcock, Assistant (detailed from the garden for partial service), William Townsend Porter, M. D., and Amand N. Ravold, M. D., Demonstrators in Bacteriology.

General Information.

The laboratory of the School of Botany is temporarily located at 1724 Washington Avenue, and a good working library, containing the usual laboratory manuals and periodicals, with memoirs on subjects likely to be studied, is kept in the laboratory for reference. This is being constantly added to, and will be made as complete as possible in any department of botany in which advanced students present themselves. The herbarium of the school, now being formed, contains already about 14,000 sheets of specimens, and will include as complete a collection as can be made of the wild and cultivated plants of the region about St. Louis. Full sets of duplicate specimens are supplied for the use of students of particular groups of plants. Advanced students will also have the privilege of consulting, under certain restrictions, the excellent herbarium and library of the Botanical Garden, including the Engelmann herbarium and library, as well as several sets of *Fungi exsiccati* and the private cryptogamic herbarium and library of the professor.

Material for laboratory use, and for the illustration of lectures, is furnished in abundance by the Garden, which, with its greenhouses and arboretum, is open to students of the School of Botany for all necessary purposes of study. In case duplicate herbarium specimens which have been studied, are desired by members of the class, they may be retained, if application is made at the beginning of the course, and are charged for at cost. Where alcohol and other expensive substances are used in quantity, as in work on bacteria, a special charge for material used will be made at the end of the course.

The instrumental equipment of the laboratory includes one microscope by Zeiss, with a working series of objectives from AA. to 1-18 inch homogeneous immersion, and accessories for spectroscopic studies and work with polarized light; ten microscopes by Leitz, with the objectives needed for the best botanical work (including nine oil immersion 1-12 in. lenses, one 1-16 in. oil immersion, and one 1-20 in. oil immersion), polariscope, camera lucidas of several patterns, etc.; seventeen dissecting microscopes, mostly by Bausch and Lomb; and a

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* Deceased.

number of simple tripods; together with instruments, pipettes, reagents, and other necessaries. Microscopes, dissecting needles, and glassware, are furnished by the laboratory, members of the class being held responsible for breakage or other injury. Razors or other instruments for sectioning are not supplied by the laboratory for ordinary work.

A special bacteriological laboratory, providing tables for thirteen workers, has been equipped with sterilizing apparatus, brood-oven, microtomes, and other accessories needed, and is in successful operation. It is hoped that ultimately another small laboratory may be devoted to advanced investigation in bacteriology, by trained physicians.

The working year for the School of Botany is divided into three terms: the first beginning with the College year and ending at the Christmas holidays; the second beginning immediately after New Years and ending the last of March; and the third beginning about the first of April and continuing until the Saturday before commencement. Classes for the study of particular groups of plants, and special work for advanced students, are planned as the demand for them appears. Whenever it is practicable, a class for day or night work, in any branch that can be taught with profit, will be formed on the application of six persons. The elementary classes are so conducted as to require no previous knowledge of botany; but admission to advanced classes depends upon a sufficient familiarity with the subjects to render the work profitable. Persons desirous of entering any class should present themselves promptly at the opening of the course. Correspondence is invited from those wishing special instruction.

Correspondence should be addressed to

WILLIAM TRELEASE,
Shaw School of Botany,
ST. LOUIS, MO.

Up to the present time, the number of special students in the School of Botany has been small, and there is no indication that they will become numerous in the immediate future; but this is not a source of either surprise or disappointment, for it was foreseen from the first. The work of such students, though it has been chiefly of an elementary character, has, I believe, been fairly satisfactory. But the most important work that such a department of a University can accomplish, is that with advanced students, aiming at the solution of some of the many problems that await the investigation of specialists. From the first, it has been the policy of the School of Botany to provide the amplest facilities within its power, for such work; and books and

pamphlets have been liberally bought where needed, for the use of those having such work in hand.

Aside from the instrumental equipment of the School of Botany, the facilities for work now include the library collected by Mr. Shaw, the entire botanical library of the late Dr. Engelmann, the herbaria of Engelmann, Bernhardi, S. B. Buckley, and Riehl, and the private cryptogamic collection and pamphlet library of the Director, in addition to a large number of duplicates from the Gay and Joad herbaria obtained through the interest of the late Professor Gray.

As calculated to be of historical interest in the future development of the Garden, and a desirable basis for noting changes that must be made from time to time, a survey of the grounds has been made, and the results are being embodied in two maps on a scale of twenty feet to the inch, one showing the contours for each two feet of difference in elevation, as well as the general features of the garden; the other accurately locating all buildings, drains, fences, beds, walks, etc., on the premises, and marking the location of even the individual trees in the arboretum and elsewhere. Such a map, though costly, is an indispensable foundation for future operations in improving and developing the grounds. From the notes of this survey, the following areas of the various parts of the garden are obtained: Garden proper, 9.4 acres; Arboretum, 20.5 acres; Fraticetum, 8 acres; Old or Vegetable garden, 3.5 acres; Grove, .6 acre; Lawn, 2.7 acres;— making a total of 44.7 acres. The grounds about the garden also include an equal or greater acreage of pasture-land, which can ultimately be used, wholly or in part, for extensions which may from time to time be found desirable or necessary. Two large green-houses, and several smaller ones, afford facilities for the cultivation of exotics, and for the propagation of tender and half-hardy plants used for bedding during the summer.

It has been popularly supposed, and is frequently stated, that representatives of all plants that are capable of cultiva-

tion in the open air in the latitude of St. Louis, are cultivated at the garden. This impression is very erroneous, and it is probable that it will never be justified. The policy of the present management, however, is to aim at as complete a representation of native plants as may be found practicable, as it is believed that such a collection will not only be most conducive to the advancement of American botany, but at the same time of most interest to visitors from foreign lands, who are found to be more desirous of learning the features of a new flora than of seeing in cultivation the familiar forms of their own. At present, it is impossible to state the number of species in cultivation in the garden, but it is very considerable and receives constant additions. From a descriptive list of the economic plants cultivated in 1886, it appears that there were then in cultivation, two hundred and thirty-two such species. The inventory made by the Administrator of the estate, shows fifty-five named species or varieties of Agave and 106 species of named palms; and the collection of cactuses and of several other groups that interested the late Dr. Engelmann, is quite considerable. The educational features of the garden are also supplemented by the extensive variety of trees and shrubs growing in the adjacent Tower Grove Park, which was given to the city by Mr. Shaw; although in its management this park is entirely distinct from the botanical garden, and primarily intended for quite a different purpose.

In closing this brief report, it is proper to state that the management of the garden will be grateful to institutions and investigators for copies of their botanical publications or for additions to the herbarium, and that all feasible assistance will be rendered in the performance of work calculated to advance botanical knowledge.

Respectfully submitted,

WILLIAM TRELEASE,
Director.

ST. LOUIS, MO., Jan. 14, 1890.

A CACTUS CORNER.

FIRST ANNUAL FLOWER SERMON.

BY THE RIGHT REVEREND DANIEL S. TUTTLE.

St. Matthew, 6:28.
"Consider the lilies of the field."

In the will of the late Mr. Henry Shaw provision was made for the preaching of an annual sermon upon "The wisdom and goodness of God, as shown in the growth of flowers, fruit and other products of the vegetable kingdom."

It is well known what a deep interest Mr. Shaw took, when living, in flowers and plants; and that the resources of his large estate have been left, in the main, to secure the sustentation and perpetuation of the "Missouri Botanical Garden."

At the request of the Board of Trustees of the Garden, I am here to preach the first sermon under the provisions of the will.

In this age it is not to be denied that utilitarianism is dominant. "For what good?" and "Will it pay?" are pertinent questions put to the front. Thoughtful people will admit that dangers to our true happiness and our best culture lie in the path of such excessive devotion to the immediately useful. Therefore, by such thoughtful ones the value will be quickly recognized of a munificent bequest that goes not to give bread to the hungry or garments to the shivering, but for the care and growth of trees and plants and shrubs and flowers.

In two places in the text of the will, the goodness and wisdom of God as manifested in the vegetable kingdom is set down.

Now I regret to say that I am not a botanist and I have no special qualifications fitting me to call your attention and guide your thoughts along the way of observing how the wonders of the vegetable world exemplify the Divine Benevolence. Yet I may be permitted to suggest some considerations to minds and hearts that are willing to hear and heed them.

The whole world of sight and sense and action predicates God, and argues the wisdom and goodness of God. The complicate interplay of the forces of Nature, the wonderful adaptation of the functions of animal life, the developments by cells, the orderly and helpful transmutations of energy, send unfailingly the observant mind to thoughts of the Maker and Ruler, God. "He that planned the ear, shall he not hear? or he that made the eye, shall he not see?" "For the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and Godhead." By Paley, a hundred years ago, this argument from design for those who think and read in English was put with singular clearness and force. And the marvelous forward strides made since in Natural Science, with the numerous discoveries lighted upon in the investigations aroused by the modern theory of Evolution, have furnished tenfold more of data than Paley had for inferring from design the existence of the designer. It may not be amiss to remind Christian folk that the hypothesis of Evolution is now upon trial and under experiment. It may go up higher into the law of Evolution, explaining all forms of existence and modes of sequence — even human animal life. If so, all right. It will be found not only not to militate against either the Holy Bible or the Christian Creed, but even to contribute to our deeper reverence for the God who makes the glories and immensities of the Universe to be but His unfoldings out of the simplicity and energy of a cell. It may go down into the darkness of an exploded hypothesis. If so, yet in the studies it has induced and the truths it has searched out, it will have proved itself exceedingly beneficial to mankind.

Marks of design everywhere apparent argue the existence of the designer, God. Wisdom and goodness in the things designed argue these to be the attributes of Him designing. Nor is the argument to be refused because of things of evil seen and known, like thistles, nettles, thorns, rep-

tiles, noxious insects, poisons, volcanoes, cyclones, sin. For some of these are changed into good. As poisons into medicines. And some exist as opportunities and stepping stones to good. Even sin itself in its existence helps furnish the sphere for the life and growth of the precious forces of choice and free-will. And any way things that we may deem unwise and bad in the world are overwhelmingly outnumbered and overmastered by things we know to be wise and good. "If I climb up into heaven thou art there; if I go down to hell, thou art there also. If I take the wings of the morning, and remain in the uttermost parts of the sea; even there also shall thy hand" of wisdom "lead me, and thy right hand" of goodness "guide me."

Looking out upon the world and its three great kingdoms that from childhood we have been accustomed to divide things into, viz., the mineral, the vegetable, and the animal, only a little thought is necessary to discover the paramount importance and interest of the one named the vegetable. Wood for fuel, and timber for houses and furniture; grains and roots and fruits for food, and flax and cotton for clothing — these show at a glance how this kingdom pays superabounding tribute for the support and comfort of man. And considering that the stored up coal of the earth that we call a mineral is of vegetable origin, and that grasses and corn sustain the herbivorous animals that he takes for food, and grass and mulberry leaves nourish the sheep and goat and silkworm, whose products he takes for clothing, and that a large portion of the curative substances of the *materia medica* is gathered from herbs and trees, we shall conclude that it is the vegetable world which by God's appointment really furnishes well nigh everything for the life and happiness of the natural man. And one understands the phrase often uttered to me by the dwellers in the Far West when I was among them — "When I make this strike or that: when I achieve this success, or that I am going to get out of here and go back to God's country." Out, it meant, from the treelessness there and the dry sand and the

gray sage brush and the brown coloring and where grasses rarely mat themselves into sod or sward, back to the trees of groves and woods, back to lawns and meadows, and where God makes green "grass to grow upon the mountains," and "herbs" and fruits "for the use of men." Is it any wonder that the imaginative Greeks peopled their forests with the Dryad nymphs making their lives to be a very part of the life of the trees, and in their metamorphoses changed the noble youth Narcissus into the flower, and the beautiful maiden Daphne into the laurel shrub?

Our Blessed Lord gave honor to the vegetable world. It is a sweet touch of His sympathy with the innocent pleasures of men, that when He miraculously fed the five thousand he commanded them, tired as they were with much walking and long fasting, to sit down upon the grass. "There was much grass in the place," says one evangelist. It was "green grass" says another. Whose heart cannot gratefully respond to the tender touch of loving kindness in the Master, as He bids, sit down upon the grass? Again and again He enforces His teaching by illustrations drawn from vegetable nature. The sower going forth to sow,—the seed springing up one knoweth not how,—the mustard growth,—the wheat and tares,—the vine and vineyard over and over again,—the barren fig tree,—the other fruitless tree cumbering the ground and deserving to be cut down,—these indicate that the Divine eye looking forth takes in the truth and gives it out again, that the vegetable world of God's appointment is well known by man, and intimately associated with him, and wondrously helpful to his life and development. And one may be permitted to remark that when our Lord institutes the Holy Sacrament for the ever to be continued memorial of His sacrifice upon the Cross, He takes from the vegetable kingdom the typical elements, strengthening bread and cheering wine, and passes by the animal kingdom, altho' the blood and flesh of a lamb had constantly done service in the sacred Paschal rites precedent. On a mountain, or what we would call a

hill, near Capernaum, He delivers His wonderful Sermon on the Mount, and looking down along the slopes to the Sea of Galilee He observes the profusion of beautiful wild flowers carpeting the earth. He is telling His disciples of the wisdom and goodness of God. He has just framed for them that sweetest of prayers, "Our Father who art in heaven." He is in a land of flowers. Palestine, it is said, has 2,500 species of flowering plants, twice as many as in all Great Britain. He says to His disciples, look out upon the flowers. They brighten the fields. They please the eye. They cheer the spirits. They sweeten life. And be not content with looking, but "Consider the lilies of the field," consider them thoughtfully and learn from them. The Father in heaven provides the beautiful flowers. They toil not for a living — as you and others do — you, Peter and Andrew and James and John in fishing, and Matthew at the money counter, and men everywhere in labor of hand or head; neither do they spin, as must your wives and daughters and sisters for needed raiment of clothing, and yet I say unto you that "Solomon in all his glory was not arrayed like one of these beautiful flowers." And if God take care for these in their growth and tenderness and beauty, shall He not take care of you? God's care and wisdom and goodness towards men our Blessed Lord is pressing, and He uses for argument the same care and wisdom and goodness as shown in the growth of the flowers.

Let us also "consider" and learn. That superabundance of 2,500 kinds of flowers in Palestine! The very thought comforts our soul. For if God do so much that seems not actually necessary to please our eye of sense, and to satisfy and uplift our love of beauty, we can feel sure of the thought that the same loving goodness will all the more work to help and guide and save us, and the same Infinite Wisdom will go on to provide things unutterable of brightness and beauty for the higher life coming. When, passing in your carriage by a thatched dwelling of some poor laborer in England, or by the wretched tene-

ment house in a dingy city, you see a flower or plant in the window or at the doorway, what do you argue? That deep and dark penury has not put out all the lights of the soul in that home. That the hard grind of daily toil has not crushed all of the tender and hopeful there. That the earthy and the sensual are not everything in count there; but within are thoughts of the pure and good, outreaching towards the far off, unattained and dim. That the tended plant and growing flower are proofs of some wise plannings for life, and some softening touches of goodness in the dwellers in that humble home.

Well, God has provided, botanical science says, 200,000 species of plants in the vegetable kingdom. And thousands upon thousands of them are flowers that are of little use or none at all towards food to eat or raiment to wear. These flowers are set as in the windows and doorway of this lower life of earth of ours, — and it is a poor, humble, and in some sense grinding life of want, too. When ye see them, then, shall ye not argue as before? God's wisdom sets them forth. God's goodness furnishes them in the full measures and running over superfluities of its inherent love. They are suggestive of noble unsatisfiedness. They prophesy of immortality. They shame what is base and narrow and impure. Sweet in fragrance, beautiful to the vision, delicate of texture, they seem nothing short of heavenly messengers to proclaim God's wisdom and goodness, and to uplift, not only the artist and poet and lover of beauty but all who will be grateful for the Divine bounty, to the true, the beautiful, the good and the eternal.

Consider the flowers of the field! The thousands of them that seem useless and unnecessary. Are we tempted to ask, "To what purpose is this waste?" Men asked such a question of old, and among them Judas. And they were rebuked. "Wastes," as we view them, may be really God's precious means of exaltation: His provisions and preparations for heavenly felicities that the eye hath not seen, nor the ear heard, nor the mind conceived: His ef-

fusions of bountiful loving kindness that marvelously warm the heart and cheer the soul.

Consider the lilies of the field! Their beauty of form and brilliance of color, surely. But the botanist can tell more. He will explain how in the family of lilies the calyx is not leaf-shaped and green as in other flowers, but as rich in tint and fine of texture as the very petals of the corolla. So that the external robe of the lily is of the same pure fairness and brilliant beauty with the precious flower enclosed within. And, as the Master said, God so clothed it, this grass of the field. Outwardly and inwardly wanting nothing in charm of color and exquisite delicacy of shape; and so elegantly arrayed of nature that Solomon in all his artificial glory could not surpass it. When the Master, without whom was not anything made that was made, said this, see you not that He knew that the botanist would find in the image employed a deeper truth than even the pleasing one that we ordinary folk perceive?

Consider the flowers of the field! "The proper study of mankind is man", insists a didactic poet. But even he would grant that the study of flowers and love of flowers may minister lessons sweet and precious for man's life and happiness. Their humility. They carpet the earth. We tread them down and in the sweetest meekness they resist not the treading. Their obedience and self-forgetfulness. Following the will of their Maker and the law of their being they come forth in blushing beauty spring time after spring time and fade and fall as summer passes. And millions of them so come and blush unseen in the uninhabited stretches of area of our globe. It makes no difference. It is not of themselves they think, but of God, and of growth, and of future life inwrapped in them.

Consider the plants of the field! Their benevolence. Stalks bend under their load of grain, — kernels grown for our sustenance. Vines root themselves in the rockiest and shallowest sorts of soil and suck thereout sweetest juices of grapes, and change dry barrenness into rich verdure.

Leaves by the millions on millions are ever busy in extracting the carbonic acid gas from the atmosphere, changing what would be a noxious vapor to us, out from our air, into the succulent greenness of their own life and the solid woody fiber of structural development.

Consider the growths of the field! Their unselfishness. The leaf is the real life of the field-growth. Roots are necessary of course. And roots draw up nourishment and sap from the soil. But the botanist will tell you how the leaf is the real life. That in the ribs and veins and jointures of the leaf is a miniature conformation of its own tree: and that from it he can divine and reconstruct the tree, as can the anatomist the animal skeleton from the bone. The leaf is lungs and stomach both for the plant. Buds are convoluted leaves. Blossoms and flowers are leaves of finer texture and brighter brilliancy. The branch and trunk of woody fiber is leaves, pressed, concentrated, modified, transmuted. Then the fruit is the arrestment of such leafy growth, and its metamorphosis from a vigorous outputting branch into a rounded juicy pulp. Now bud and blossom, fruit and seed, look to the begetting and sustentation of another life than the plant's own. In the vegetative adding of woody fiber it would be giving to its own growth. What a striking lesson of unselfishness. And proclaimed wherever there are blossomings, and flowerings and fruits. These have come at cost to the plant of giving up its own growth. It has died to itself that it might live for others. Every palatable fruit it has provided for man has grown from its gift of self-sacrifice. Every bud and seed it has furnished for another individual of its species have come from the very sap blood of its existence necessitating the cutting off of its own vegetative development. See in the innumerable growth of the vegetable kingdom therefore the very embodiment of unselfishness which is the life and crown of true religion. And often and often the plant dies its death of self-sacrifice in the act of giving unselfishly blossom and flower and seed for another's life.

Consider the trees of the field! Their patience and endurance. Storms of violence hurl themselves against them. In steady firmness they withstand the onset. They furnish grateful shade to man and beast. They protect our springs and water-courses. They stand guard that the sequestered vales may enjoy perennial peace and shelter. They are sentinels of the centuries. Among living things they are the oldest habitants of our planet. Oaks hundreds of years old, and cypress and yew trees thousands of years old, are breathing by their leafy lungs and rejoicing in their veins of upflowing sap to-day. Patiently and enduringly they have stood in their lot to meet what God appointed. Types of silence and restfulness. Workers, steady and unwearied in developing cell after cell and in repairing waste and depositing growth throughout the countless years. Lessons of strong help to man when restlessness and despair assail.

The tree of life in the midst of the Paradise of Eden! It stood for preciousness and with promising of all that the blessed word life means. Wondering thoughts go back querying what it was and what it had to give. That other tree of life which is in the midst of the Paradise of God! Hoping and trustful hearts out-reach for it. And it is promised to him that overcometh that he shall eat thereof.

Flowers, plants and trees! Ye are exemplifications of God's wisdom and goodness. Ye do your duty well. Your peace is innocence. Your life is purity. Your death is unselfishness. And ye have no stinging self-consciousness of the ill desert of sin imbittering your sap blood as we men have. It's not yours to ask for pardon nor to suffer with remorse. Right cheerily, then, you are ready always, I am sure, to meet and respond to our Benedicite hailing — "O all ye Green things upon the earth, Bless ye the Lord! praise Him and magnify Him forever."

PROCEEDINGS AT THE FIRST ANNUAL BANQUET

GIVEN BY THE TRUSTEES OF THE GARDEN AT THE SOUTHERN HOTEL, MAY 26th, 1890.

Under the provisions of the twenty-fourth paragraph of the fourth clause of Henry Shaw's will, the Trustees of the Garden issued invitations in the early part of the present year, for the first annual banquet in honor of the Founder of the Missouri Botanical Garden and the Shaw School of Botany. In response to these invitations, a company of about one hundred gentlemen assembled at the Southern Hotel, in St. Louis, on the evening of May 26th.

The gathering included the following guests: —

HON. DAVID R. FRANCIS,
Governor of Missouri.

BRIGADIER-GEN'L WESLEY MERRITT, U. S. A., Commanding the Department of Missouri.

HON. NORMAN J. COLMAN,
Ex-Secretary of Agriculture.

HON. AMOS M. THAYER,
United States District Judge.

HON. WARWICK HOUGH,
Ex-Judge of the Supreme Court of Missouri.

HON. R. E. ROMBAUER,
Judge of the St. Louis Court of Appeals.

HON. JACOB KLEIN,

HON. D. D. FISHER, and

HON. J. E. WITHROW,
Judges of the Circuit Court, City of St. Louis.

HON. J. C. NORMILE,
Judge of the Criminal Court, and

HON. R. A. CAMPBELL,
Judge of the Court of Criminal Correction, of St. Louis.

HON. G. A. FINKELNBURG.

F. H. SNOW,
Chancellor of the University of Kansas.

W. W. SMITH, LL. D.,
President of Randolph-Macon College.

REV. J. D. HAMMOND,
President of Central College, Fayette, Mo.

PROFESSOR W. G. FARLOW,
Of Harvard University.

PROFESSOR E. M. SHEPARD,
Of Drury College, Springfield, Mo.

PROFESSOR G. D. PURINTON,
Of the University of Missouri.

PROFESSOR W. A. KELLERMAN,
Of the Agricultural College of Kansas.

THE LINNEAN HOUSE.

PROFESSOR T. J. BURRILL,
Of the Illinois University.

GEORGE E. LEIGHTON,
President of the Board of Directors of Washington University;

M. S. SNOW,
Acting Chancellor, and

PROFESSORS S. WATERHOUSE,
J. K. HOSMER,
C. M. WOODWARD,
H. S. PRITCHETT, and
H. C. IVES,
Of the same Institution.

J. H. DILLARD,
Principal of Mary Institute.

W. G. HAMMOND, LL. D.,
Dean of the St. Louis Law School.

DR. H. H. MUDD,
Dean of the St. Louis Medical College.

DR. JAMES HALL,
Director of the New York State Museum of Natural History.

ARTHUR WINSLOW,
State Geologist of Missouri.

LEVI CHUBBUCK,
Secretary of the State Board of Agriculture of Missouri.

DR. G. HINRICHS,
Director of the State Weather Service of Iowa.

C. H. JONES,
Editor of the *Republic*, and

J. A. DILLON,
Editor of the *Post-Dispatch*, of St. Louis.

REV. D. S. PHELAN,
Editor of the *Western Watchman*.

JOSEPH BROWN,
Auditor of the City of St. Louis.

J. W. KAUFFMAN,
President of the Merchants' Exchange of St. Louis.

F. M. CRUNDEN,
Librarian of the Public Library of St. Louis.

REV. P. P. BRADY,
Vicar General of the Roman Catholic Diocese of St. Louis.

REV. DR. S. J. NICCOLLS.

REV. J. C. LEARNED.

REV. DR. H. A. STIMSON.

REV. S. H. SONNESCHEIN.

REV. C. M. DAVIS.

REV. M. BRENNAN.

REV. C. G. DAVIS.

HON. E. O. STANARD.

MR. RICHARD SCRUGGS.

MR. SAMUEL CUPPLES.

MR. F. N. JUDSON.

MR. W. T. COLEMAN.

MR. THOMAS DIMMOCK.

MR. HENRY C. HAARSTICK.

MR. ROBERT MOORE.

DR. D. S. H. SMITH.

JUDGE CHARLES SPECK.

DR. JOHN GREEN.

MR. E. H. LINLEY.

MR. PETER L. FOY.

MR. M. L. GRAY.

JUDGE J. H. LIGHTNER.
MR. H. N. PATTERSON.
MR. CARL LUMHOLTZ.
MR. CARLOS S. GREELEY.
JUDGE S. M. BRECKENRIDGE.
MR. GEORGE I. BARNETT.
HON. D. H. ARMSTRONG.
MR. CHAS. E. HALL.
MR. J. E. KAIME.
MR. WM. H. THOMSON.
MR. ROBERT S. BROOKINGS.
MR. J. R. LIONBERGER.
MR. DANIEL CATLIN, and
MR. E. C. SIMMONS.

The Botanical Garden was represented by

RUFUS J. LACKLAND,
President of the Board,

HENRY HITCHCOCK,
Vice-President of the Board,

RT. REV. D. S. TUTTLE,
Bishop of Missouri,

DR. J. B. JOHNSON,

A. D. CUNNINGHAM,
Secretary of the Board, and

MR. JAMES E. YEATMAN,

MR. JOSEPH W. BRANCH,

C. F. MILLER,
President of the Board of Public Schools of St. Louis, and

PROFESSOR F. E. NIPHER,
President of the Academy of Science of St. Louis.

WILLIAM TRELEASE,
Director of the Garden.

The dinner having been served, the assembled guests were called to order by the Chairman, Henry Hitchcock, Esq., who said:—

Gentlemen: The Trustees of the Missouri Botanical Garden, and you as their honored guests, are assembled in pursuance of an express provision in the will of its founder, the late Henry Shaw, bequeathing a certain sum annually "for a banquet to the Trustees of the Garden and to the guests they may invite, literary and scientific men and friends and patrons of the natural sciences."

To such an assemblage, so convened, an uncommon interest attaches. It was obviously the wish of Mr. Shaw that this social gathering should be one means of making

known, especially to the class of men thus indicated, the purpose, the promise and the progress, from year to year, of the institution upon the planning and building up of which he bestowed the thought and labor of more than forty years, by his last will devoting the bulk of his fortune to its endowment. With what success his beneficent and far-reaching plans shall be carried out, is for the future to reveal. What its promise is, what similar institutions have done and are doing elsewhere, and what benefits may be expected from it to the people not only of our own State and of the United States but to mankind, we hope presently to hear from those who are competent to speak. I have been requested to say an introductory word or two as to its purpose and organization.

In general, that purpose cannot be stated in better or briefer words than those of the tribunal which, upon the application of the Trustees for a judicial construction of the will of Mr. Shaw, determined and adjudged that by it was created "a charitable trust, for educational and scientific purposes, in the special branch of botany."

As more fully set forth in the will itself, his purpose was, to establish and endow —

> "a Botanical Garden, easily accessible, which should be forever kept up and maintained for the cultivation and propagation of plants, flowers, fruit and forest trees, and other productions of the vegetable kingdom, and a museum and library connected therewith and devoted to the same and to the science of botany, horticulture and allied objects, for the promotion of science and knowledge."

Express provision is also made for instruction to garden pupils in both practical and scientific horticulture, agriculture and arboriculture, also for scientific investigation in botany proper, in vegetable physiology, the diseases of plants, the study of the forms of vegetable life, and of animal life injurious to vegetation, and for experimental investigations in horticulture, arboriculture and kindred subjects: it being also provided that the Garden shall be kept open, for the benefit of the public at large, as the Trustees

may prescribe, every day except Sundays: though the will subsequently provides that it may be open on two designated Sunday afternoons during the summer season.

In connection with the Botanical Garden, and, as his will declares, in order to augment and perpetuate its usefulness, Mr. Shaw established and endowed in October, 1885, nearly four years before his death, a School of Botany as a department of Washington University in this city: to that extent anticipating by deed the bequests in his will, which bears date in January, 1885. The objects of the School of Botany are declared to be, —

> "the promotion of education and investigation in that science, and in its application to Horticulture, Arboriculture, Medicine and the Arts, and the exemplification of the Divine wisdom and goodness as manifested throughout the vegetable kingdom."

To secure their harmonious co-operation in these purposes, it is required that whenever practicable a Professor of the School of Botany shall be the Director of the Botanical Garden; and the Trustees of the Garden are required, up to a certain amount, to make good any deficiency in the annual income of the School of Botany from its endowment.

The Botanical Garden, as laid out and maintained by Mr. Shaw himself, is part of a tract of about 150 acres in all, on Tower Grove Avenue in the southwestern part of this city: of which about 45 acres is occupied by the Botanical Garden, the Arboretum and Fruticetum, including the Museum building and the late residence of Mr. Shaw, which last, under the provisions of the will, is now the residence of the Director of the Garden; but the will contemplates and provides for the ultimate extension of the Garden over the remainder of the tract. The fund devised for the maintenance and extension of the Garden, and for the educational and scientific purposes already mentioned, consists chiefly of real estate in this city, a considerable part of which is improved, yielding an income sufficient for the immediate demands of the trust, and likely to be

largely increased in future by the leasing or improvement of the remainder.

All this property was devised by Mr. Shaw, upon the express trusts already mentioned, to certain persons named or designated in his will, who should together constitute a Board of Trustees, and who are required to keep written minutes of their proceedings. This Board has no corporate character. It is simply a body of individuals, all alike and equally charged, as co-trustees, with the execution of the trusts declared in the will, and who are subject, like all other trustees, to the supervision and control of a court of equity in the performance of their duties. The will does not confer upon any Trustee any power or precedence as such; but it declares that the acts of a majority of the members of said Board, at any meeting regularly called and held upon due notice, shall be deemed and taken, for all the purposes of said trust, to be the acts of said Board and of said Trustees. It designated nineteen devisees, fourteen of them by name, the remaining five by style of office, namely — following the order of the will — the Chancellor of Washington University, the Bishop of the Episcopal Diocese of Missouri, the President of the Public Schools, the President of the St. Louis Academy of Science, and the Mayor of the City of St. Louis, and their respective successors in office. Four of the devisees named in the will having died before Mr. Shaw,— the late Gerard B. Allen and Adolphus Meier of this city, Dr. Asa Gray, the distinguished botanist, of Cambridge, and Professor Baird, late Secretary of the Smithsonian Institution,— it has been judicially determined that the number of Trustees was thereby reduced to fifteen in all. The actual number of Trustees at present is fourteen, the office of Chancellor of Washington University being temporarily vacant.

In order to assure the validity and permanency of this trust, Mr. Shaw obtained, thirty years ago, the passage by the Legislature of Missouri of a special Act, approved March 14, 1859, expressly referred to in his will. This Act

authorized him, either by deed in his life-time, or by his last will, or both, to devise any part of his property to Trustees for these specific purposes, and to provide for the succession, removal and substitution of such Trustees: and accordingly the will provides that all vacancies in the Trust shall be filled by the remaining Trustees.

Mr. Shaw departed this life in August last, having reached his ninetieth year and having retained his vigor of mind and body to a remarkable degree. His will was admitted to probate in September, soon after which the Board of Trustees was duly organized as therein provided, and without delay received possession of the Garden and other real estate devised to them. As provided by the will, they at once appointed Professor William Trelease Director of the Garden, that gentleman having been appointed Professor in the School of Botany in June, 1885, upon the nomination of Mr. Shaw and the recommendation of Dr. Asa Gray. To him is directly committed the development and fulfillment, from year to year, of the ultimate purposes of the trust: its business administration and superintending control, within the limits assigned by the will, remaining with the Trustees. We hope for the pleasure of hearing something from Professor Trelease concerning the educational and scientific work already planned and entered upon, with an intelligence, energy and efficiency on his part to which the Trustees gladly avail of this occasion to bear witness.

This rather dry and business-like explanation fulfils, I believe, the preliminary duty assigned to me. It is for others to speak of that interesting theme, the broad and beneficent purpose which gives vitality and interest to this occasion. An attempt on my part to do so would, I fear, only expose my own ignorance: for although the process of my earlier education included some compulsory digging of Greek roots and some attention to what were called flowers of speech, I am sorry to say that it did not include the study of botany, nor any adequate instruction in the won-

SUMMER HOUSE IN THE FRUTICETUM.

ders and beauties and riches of the kingdoms of Nature. In that regard, too many professional and business men must still be classed with the hero of Wordsworth's poem, of whom the poet says:—

> "In vain, through every changeful year,
> Did Nature lead him as before.
> A primrose by a river's brim
> A yellow primrose was to him,
> And it was nothing more."

And yet, to understand and appreciate the beneficent purpose and value of a trust like this, surely there is no need of technical knowledge. No one need be urged to enjoy the beauty of the flowers, the soft refreshment of the green grass and the soothing murmur of the rustling leaves. To the dullest eye new lustre comes, to the most unsympathetic soul a new joy, with that annual miracle newly wrought with each returning spring, the resurrection of Nature from her wintry grave. If there is any knowledge common to us all, it is that of the relations of the vegetable kingdom to our daily life, in the matter of food and raiment and refreshment of body and mind. To the most prosaic mind a moment's thought recalls the infinitely various economic uses of plant and flower and fruit and tree. The romantic interest attaching to the daring exploits and marvellous achievements of Stanley in the heart of Africa is not lessened by the revelations he brings back of new fields for commercial enterprise afforded by its tropical forests. But it is obvious to the most careless mind that the true key to all the boundless wealth and the exquisite beauty which the goodness of God has so lavishly bestowed upon us in the vegetable world must be furnished by Botanical Science. For by Botanical Science, as I suppose, is meant that accurate and extensive knowledge of the various productions of the vegetable kingdom, which shall enable us, not only to classify and arrange them in families, orders, genera and species, but to determine their properties and value for the

use of mankind, as well as their habitat and history, to ascertain the laws of their growth and being, and by the patient and skilful application of those laws even to increase and diversify that beauty and still further to develop that wealth.

To such a purpose, when his life had scarcely reached its noon, did Henry Shaw resolve to devote the remainder of his days, consecrating to it the acquisitions of an assiduous and successful industry. For that purpose, by his last will, this Trust was founded, and is to be administered by those to whom it will be a labor of love.

You will gladly join with me, gentlemen, in doing honor to the Founder of the School of Botany and of the Missouri Botanical Garden: and to that sentiment I ask the President of the Board of Directors of Washington University, Colonel Leighton, to respond.

COLONEL LEIGHTON.

Mr. Chairman: As the representative of Washington University, an institution selected by Mr. Shaw to carry out a considerable and most important part of the work embraced in his wise and beneficent scheme,— a part which supplements and makes complete that which he has placed in your hands as Trustees of the Missouri Botanical Garden, — I cannot but take pleasure in responding to the sentiment you have given and briefly expressing the appreciation of my associates in the governing Board of Washington University for Mr. Shaw, who you will remember was an associate for some years; and of the opportunity afforded them by him to establish, under the most favorable conditions, in connection with the garden, one of the best equipped schools of botany in the world.

But I find myself, at the very outset, embarrassed in attempting to distinguish any especial feeling of gratitude on the part of the University from the common feeling of grat-

itude which we all experience as citizens of St. Louis, in the thought of the broad, bountiful, beneficent and far-reaching scheme as a whole. We unhesitatingly place the name of Henry Shaw upon the lustrous roll of honored citizens, living and dead, who, having been merchants, manufacturers, lawyers, clergymen, or physicians, have been more than merchants, manufacturers, lawyers, clergymen or physicians in their relation to the progress and well being of our City.

This is the first annual meeting under a peculiar and most commendable provision of your Trust, — the first of a series which, with ever-changing constituents, may, and probably will, extend through centuries.

Now, when most of those of us who are privileged to be present remember Mr. Shaw as a personal friend, — when so many are here who have often shared the hospitality of his house and home, — a characteristic which will diminish with the years, — now let us make a record of our sense of his high character as a citizen, his public spirit, his broad sympathy and generous help in all that was ennobling and uplifting, his intense love for our City, his simple, unostentatious and useful life. Honor his name as we may in the present, as we move away from the years of contemporary knowledge of the man, the appreciation of his splendid beneficence will increase, and our successors will come to measure the man, — not as we do by his personal qualities, but by the magnificent result of his life.

Private munificence in varied forms is one of the distinctive and most honorable characteristics of our American civilization. In a government like ours, the things which most uplift and ennoble a community must of necessity spring from the people, as individuals. Government may protect individual rights in person and property, may promote public works of a necessary character, may clear the way for personal enterprise and thrift, and give them a fair field; but it cannot, in any due degree, as a government, where the use of money is required, do much to stimulate or de-

velop the higher life of a community. Education, art, science, in their higher departments, — all that which we call culture, as well as all, even the most common charity, must look — not to the government, but to the individual, to assert and enforce their claims. And the individual who is to do this, is not of a distinct race or profession or pursuit. He is, and must be, one of ourselves. He must be the man whom we meet in our daily walk, as the merchant, the manufacturer, the lawyer, financier, clergyman, or man of affairs, who has been made to see, and does see, that there is a more complete and more enjoyable life than that which is wholly confined within the narrow boundary of the warehouse, the office, or the shop.

If we should strike out from our States and cities the institutions, religious and secular, founded and sustained solely by private munificence, the barrenness of our civilization in its higher range of influence would be most startling. Our churches, colleges, academies, museums, asylums, hospitals, libraries, our institutions for the study and development of science, art, music, — all these owe their origin and their support to a recognition on the part of individual citizens of a vital need which Government cannot meet.

Mr. Shaw had the capacity and the good fortune to see that there was a fuller life for him than his career as a merchant afforded, and before middle age he found, in that wonderful and complex mystery which we call nature, as manifested in fruit, and flower and tree, the possibilities of that larger life to him which brightened and blessed more than half a century of his own existence, and will continue to brighten and bless this community for centuries to come.

It was a large thought, that which years ago came to him, to perpetuate the magnificent work which his love and interest had created and developed; and having shared it most generously with his contemporaries, to make it live for generations to come.

Many men have had just such dreams of beneficence. It is the weakness of our poor human nature that we permit

our dreams of usefulness to fade, and we die with grand purposes unfulfilled. I am a poor interpreter of our common nature if I am wrong in saying that some time, in better hours, have come to each of us, those noble purposes of beneficence, or larger usefulness and wider influence, quite within our reach, which, if they had been permitted to take shape in created work, would have brought to this city of St. Louis a golden age, in all that ennobles and uplifts a community.

Mr. Shaw, however, made real his dream of usefulness, in an executed scheme, — a scheme thoughtfully and wisely worked out in all its details long years ago, and in no degree dependent upon his own years of life. Death makes no break in the continuity of a life so merged in a definite and an accomplished purpose.

Mr. Shaw's purpose, whilst largely to give pleasure to the whole community by the maintenance of the garden, was something more than that. His own enjoyment was not simply from the æsthetic side. He had learned to know that, beneath the transient sensuous beauty of leaf and branch and flower, was a more occult, yet a more permanent and a diviner beauty of law, as yet but imperfectly revealed; and the establishment of the School of Botany, where patient study of that law might be pursued by the few, was a necessary supplement to the full enjoyment of the garden by the many. There is no word left for the critics to speak as to what more might have been done. The whole is complete and rounded and perfect as Achilles' shield.

And not the least consideration, it seems to me, in honoring Mr. Shaw, and one which addresses itself peculiarly to us, is the thought that his beneficence, whilst wide and far-reaching, and comprehensive in its influence and in its results, is essentially a local beneficence, — one springing in a great degree out of his affection for the city of his more than three-score years of residence.

I cannot but think that the tendency of the age is to les-

sen our local affections and interests. Whether it be due to the intensity of our modern life in what are called practical directions, leaving little leisure for the nurture of the finer sentiments of life, whether it be the increased facility of inter-communication which tends to broaden, rather than localize, our personal life, or the cosmopolitanism of the press which makes us all, in spite of ourselves, citizens of the world, and compels our attention to the world's larger stage of action, — whatever it be, I think the result is to be observed; and it is a pleasure to be reminded by this generous creation of Mr. Shaw, of what it is to give back to St. Louis in some form, some portion of what she has so bountifully given to us.

It is of minor importance in what shape or direction such a feeling manifests itself, nor is it dependent on great gifts, but it is of importance that all our professions of love and interest in our city should take form, — not in words, but by working together in ways that, year by year, advance her in some degree, however small, in those countless ways that make up what we call civilization.

An occasion like this presents the opportunity for only the briefest expression of the thoughts which arise, and I must not detain you. Again and again, through the years to come, words of commendation will be spoken at these annual meetings, justly honoring Mr. Shaw and honoring his work. May we who knew him for many years, put upon record our appreciation of the great influence of his long, serene and simple life, and of the grand purpose in which it culminated. It was like one of those perfect summer days in which he loved to walk in reverent friendship with the flowers.

His twelve long hours,
Bright to the edge of darkness; then the calm
Repose of twilight,—and a crown of stars.

The Chairman then called upon Professor William Trelease, the Director of the Missouri Botanical Garden, as follows:—

It has already been stated, gentlemen, that the chief purposes of this Trust are educational and scientific. The will which created it provides that the Director of the Garden shall "employ his energies that from year to year the institution under his charge shall grow up in efficiency in promoting the ends in view in its inception."

Professor Trelease, the Director of the Garden, whom we have the pleasure of having with us this evening, was a pupil of Dr. Asa Gray, a name honored by all votaries of Science, not only of Botanical Science, but of Natural Science in its widest sense. Four years ago, upon the recommendation of Dr. Gray, as well as his own conviction of its appropriateness, Mr. Shaw nominated Dr. Trelease as Professor of the School of Botany, with the purpose that when the proper time should come he should be appointed the Director of the Garden,— a duty which the Trustees promptly and gladly fulfilled. In his hands chiefly rests, as I have already said, the development of the institution.

You will join me, gentlemen, in wishing all success and usefulness to the Missouri Botanical Garden. I have the great pleasure of asking Professor Trelease to tell us something of its promise, of the plans which have been adopted and of the work which he has so well begun.

MR. TRELEASE.

There is one branch of Botany, Mr. Chairman, that I have never cultivated very much,— the one my friend Mr. Hitchcock referred to, and that has been so fully exemplified in what has been said already,— that branch relating to the flowers of speech. However, there are a few plain botan-

ical facts that I presume are worth more at this particular stage in the development of the Garden than a more polished statement of the case which left some of those unsaid. For that reason, possibly, what I may be able to say may have some interest and some value.

Nobody on being called on to assume the direction of an institution which promises so much as this Garden, could fail to be impressed by the fact that a very considerable part of what the Garden may realize must depend upon the adoption, in the very beginning, of a broad and comprehensive, and yet very elastic, plan for its development. I am far from feeling able to form such a plan, which must depend upon a good and full knowledge of what may properly be held to be the functions of such an institution; but I have thought that possibly it might not be without interest if I were to run over two or three of the things that occur to me as important functions of a Garden.

If this were the time and place for it, I have no doubt that a discussion of the history of botany and botanical gardens might be made to throw a good deal of light on this question, for history has its lessons in science, as in politics. But I must content myself with saying that the early ideas of botany, and the early botanical gardens, were strictly utilitarian. A botanical friend, a few weeks ago, on his way to Mexico, told me that the simple country people with whom he is thrown in contact in his botanical tours in the wilder parts of the country, people who have no money to buy drugs with, are extremely interested in the plants which can be used for healing their ailments. They are obliged to look these things up for themselves, and he said that whenever he collected a plant and was seen doing so he was at once asked "Qué remedio?"—"What does the thing heal? What is it good for in that way?" A great deal of the early botany and a great many of the early botanical gardens depended upon a considerable interest in this same question,— the healing virtues, the medical properties, of plants. This is, of course, a strictly utilitarian idea of botany.

There is a pleasure that we all derive from seeing flowers. There is a certain restfulness in the green of the grass. There is a satisfaction in seeing things grow. In planning anything in the way of a garden, even limiting it by prefixing the word "botanical," it is impossible to divest the idea of a garden from the idea of a park, — a place to which people can go for their recreation, a place where a love and taste for the beautiful may be at once cultivated and gratified; and it is to me a real pleasure that, by the express provisions of his will, Mr. Shaw has determined that the ornamental features of the Garden which has for many years proved a source of pleasure to the citizens of St. Louis and to visitors from a distance, shall be maintained; that there shall be no less attractiveness than in the past, but rather more. I think it is a very easy thing to promise that this provision shall be complied with. It is a pleasure to feel this. And yet it costs a great deal of money to maintain a park, and I have no doubt that some of my botanical friends will criticise the annual expenditure of a very large sum of money for maintaining the strictly ornamental features of the Garden. I am rather glad that if so, they cannot criticise me personally for this. Whether I feel that in all cases this money is well spent or not, the general feeling cannot be resisted that it will do good. Not only can a garden which is an ornament conduce to the pleasure of people, but in a very unobtrusive way, by simply giving access to a named collection of plants, it is doing much more than that. People see a plant with a name, and ask a question and answer it at the same time. They get information. They become started; and it is a very simple matter, having once begun that kind of questioning, to continue it. And so the simple, unobtrusive naming of a collection of plants is, I think, doing a great deal of good educational work.

But this idea of contributing to pleasure, and the attendant idea of giving such information as comes incidentally, is that which is farthest from what I have already spoken of as the original intention of a garden, — the strictly utilitarian idea

of a garden. The question has been asked me many times, "What technical uses can the Garden be put to?" I shall not attempt to take the time that would be needed to answer this question in full, and yet there are a few such uses that it may be proper to run over. One of them is education, which has already been touched upon; and Mr. Shaw has shown the importance that he attached to this by the separate endowment of a School of Botany. To furnish material, — to furnish other facilities, — for the study of botany and for instruction in botany, is one of the very important functions of such a garden. But botany is a rather comprehensive subject. It may be made to include practically all knowledge of plants and of their growth and the laws of their growth. Mr. Shaw indicates, by a word here and there in his will, and by other information that shows it even more clearly, that he believed that one of the important functions of the educational side of the Garden, in the future, should be the training of gardeners. Not merely men who can grow one kind of rose and make that a commercial success, — that is a good thing to teach, — but men who can grow not only one kind of rose, but any roses that may be brought to their care. Not only roses, but other plants needed for ornament. Not merely ornamental plants, but fruits. Not merely fruits, but medical plants. In a word, that instruction might be given in all that concerns the growth of plants for all useful purposes. One of the steps that the Board of Trustees of the Garden, — who, I may say, have very cordially supported me in every wish that I have shown so far toward the development of the Garden, — one of the steps that they saw fit to take very early in their organization, was to provide for this kind of instruction. The matter is an experiment with us as yet. It may come out well, and yet we shall undoubtedly learn a great deal in the first few years; but it is under way, and has been started by the endowment of a series of scholarships, — yielding no large sum of money, but enough to pay the expenses of students and to give them this kind of instruction. Not merely to

teach them botany, but to teach them in addition to that how to grow plants. Not merely to teach them how to grow plants, but what those plants are, and the other things that are closely connected with botany and practical gardening. In a word, to make broad-minded gardeners. And I think that as time goes on and as we have opportunity to test, by their results, the steps that are being taken, and to modify them in accordance with the needs that become evident, we shall find that a very considerable part of the good the Garden can do will be done in just this way.

And yet this is only a small part of the work. A very considerable part of the office of any institution, with facilities for any kind of work in addition to the instruction it gives, is the manufacturing, if I may use the term, of new material: the working out of new tools; the elaborating of undigested material; and that brings up, of course, the whole question of scientific botany. I can foresee that, as time goes on, the Garden, if no serious mistakes are made in its management, will be able to contribute in no small degree to a knowledge of our North American flora, — of the plants of North America. Any local botanist well knows the plants within a radius of ten or twenty miles about his home. This is a simple matter. But Doctor Gray lived to see the completion of only about one-third of the entire synoptical elaboration of our North American flora. We may know the plants within a radius of twenty or thirty miles about St. Louis; but the North American flora as a whole has still to be worked out in such shape that any student of fair intelligence can determine what a plant from certain parts of the country is. I do not for a moment think that we shall play as important a part in this work as other institutions may do; as Harvard University, where Dr. Gray's typical herbarium is located, for instance; but I do feel that we can contribute to this work in no inconsiderable degree.

A great many of the characters of plants are transient. They disappear after a few weeks, after a few days,

after a few hours in some cases; and yet these characters can be preserved indefinitely if the plant is dried or otherwise preserved properly at the right time. A great many of the characters of plants can be determined only while their fruit lasts, while the flower lasts; and so, for these and other reasons, comes the necessity of forming an herbarium and a museum,— a collection of material, in other words, in condition for the study of these characters a decade or a century after the plants were collected. A great many of the characters of plants, however, cannot be preserved in this way; and yet a drawing faithfully made at the time when the character is well shown,— for instance, in a transient flower,— may last forever. Hence the occasion for a library, in which these characters are faithfully recorded in word and sketch. Such a library and herbarium are being formed in a quiet way for the Garden, and will be enlarged in such measure as seems wise. We may in a given day use only two, or three, or twenty specimens or pages of a book; but in the course of years all come into use; and I regard as the foundation for any institution which is to have scientific value, such collections as these, which are to be drawn on when they are needed, as a basis for work.

A foundation of this sort cannot be made in a day. It is not a thing which by a herculean effort can be gathered at the moment when it is needed for use. It is a foundation that must be laid stone by stone. It is very expensive,— in time, money and energy,— and at the same time it is a thing that must gradually be brought together. I hope that here at the Garden this may be done until we shall have laid such a working foundation as may lead to the best work that can be looked for.

Such a collection, with the other things that group about it, gives the means of studying not only the systematic botany of a region,— of studying what plants are,— but also of studying the ways in which plants grow; contributing thus directly to horticulture through the advance-

ment of a knowledge of vegetable physiology,—a subject which is by no means exhausted; —and by the study of the diseases of plants and of the possible preventives or remedies for such diseases,— a subject which is as yet almost unexplored. I look forward to a great deal of work that may be done in this way, and I hope that as time goes on the Missouri Botanical Garden may play its part in such work.

And yet, the facilities that I have spoken of are only the foundation for work. The character and strength of an institution depend primarily upon laying a good foundation, but afterwards upon having builders who can complete a superstructure worthy of the foundation; and I hope to live to see the Garden the nucleus for a collection of botanists who may be known at home and abroad as leaders in the subjects of their specialties. If we realize what I look forward to, I think that we shall carry out to its fullest extent the extremely wise and broad plan of the Founder of the Garden.

The Chairman then called upon his Excellency, David R. Francis, Governor of the State of Missouri, in the following terms:—

Gentlemen: Natural science belongs to no locality, to no country,—I may add, to no historic time, for the ancient records in which is found "the testimony of the rocks," take us back to periods whose duration the geologist and palæontologist confess their inability to determine. Its domain includes not merely every quarter of this terrestrial globe, but the most distant and unfathomed realms of space. Its votaries seek to discover those all-pervading, all-sustaining laws of Nature and of Nature's God, which assign to every molecule and atom its place and function in the universe, and in obedience to which myriads of blazing suns, with their attendant planets and satellites, pursue their stately march. The spectroscope, which tells the

manufacturer of Bessemer steel at what moment carbon enough has been burnt out of the seething white-hot mass of metal in the converter, also reveals to the physicist the constituent elements of the glorious orb which floods this earth with its life-giving light. To the discovery of those laws and their application to the wants of our daily life, we are constantly more and more indebted for the comforts, even for the necessities, of civilization. Our tables bear contributions from every clime and zone, the knowledge of whose properties and value, even the methods of their production, are the gift of natural science: and in respect of some of the most valuable of them, under the fierce competition of modern industry and trade, that knowledge has become one of the conditions of success in conducting the commerce of the civilized world.

And yet this trust, created for the promotion of a branch of science which has to do with the vegetable products of all countries, has its own local habitation. By choice and by adoption, Henry Shaw was a citizen of St. Louis, a citizen of Missouri. In founding this trust, he gave to it the name of this great State, a State whose boundless resources, mineral and vegetable, are only beginning to be known.

We are this evening honored, gentlemen, and the Trustees of the Missouri Botanical Garden are extremely gratified, by the presence of the Chief Executive officer of this State: and in announcing the sentiment, "The State of Missouri," I can ask no fitter or more competent man to respond than Governor Francis.

GOVERNOR FRANCIS.

Mr. Chairman and Gentlemen: I am almost afraid, in this company, to give or attempt to give the author of any sentiment or expression. I believe it was Doctor Holmes, however, who said that the society of men of genius was

intoxicating. I do not know how to repay your Chairman for calling upon me upon this occasion after an express agreement not to do so, unless it be by relating an experience which General Sherman told me he had had at the celebrated Clover Club in Philadelphia. The General had been invited, he said, time and again to attend the meetings of that Club, but knowing the practices of its members he had declined, with thanks, the invitations. Finally, the President prevailed upon him to accept the invitation upon the express condition that he would not be called upon to speak. The General was seated near the President, and after one or two of the distinguished guests had been called upon to respond to sentiments and had attempted, only, to do so, — because the Club does not permit a man to speak very often, — the Chairman arose and said, "We have with us this evening a distinguished guest in the person of the General of the Army. I have agreed not to call upon him upon this occasion, but," said he, "you all know what a liar I am." I do not mean that that applies to the Chairman of this meeting.

Especially is this company embarrassing, and it is with trepidation that I rise to respond to this sentiment, when I see seated around this board not only men distinguished in the world of Science, but many of my old Professors who but a few years ago aided me in delving for those Greek roots to which our eloquent Chairman alluded a few moments ago; but, gentlemen, the sentiment "The State of Missouri," is one which ought to strike a responsive chord in the breast of every citizen of the commonwealth. What idea is conveyed to our minds by the mention of that name by which we designate this commonwealth? We are reminded, of course, that this is an integral part of the federal Union and that whilst as a State it is a constituent part of an indissoluble Union, at the same time it has sovereign rights which are expressly agreed to in the compact which made the Union. I am reminded of this phase of the question by a discussion which I had with your

honorable Chairman this evening as to the bearing of the "Original Package" decision. Whilst submitting gracefully and peacefully to the will of the majority, we cannot forget that all power not given to the Federal Government was reserved to the States in that compact, and that any other power which arrogates to itself the right to enact police and sanitary regulations violates the spirit and the letter of that compact. But there is another idea conveyed to our mind. When we speak of Missouri, we immediately think of this broad expanse of territory, greater in area than any State east of the Mississippi, fertile and diversified in resources, and a State which yields annually its quota towards the wealth of this Nation. A State which, during the year now ending, will contribute over ten millions of dollars to the mineral wealth of the country, to say nothing of its agricultural product. A State whose timber interests are second to none; and, in that direction, that great public benefactor whose memory we meet here to honor this evening has conferred upon this State a lasting benefit. He has given us the means and pointed out to us the way in which we can utilize these great gifts of Nature. But higher and greater than all these, when we speak of Missouri, is another feature, and that is the citizens that create and compose the commonwealth. Those who make it what it is, those who develop its resources, guard its honor, enhance its enlightenment, augment its glory, promote its progress, make its history; and, among those citizens, we are proud to claim Henry Shaw. The gentlemen who have spoken here this evening, whilst paying just tribute to the memory of that man, seem to have rested upon the fact that he was a citizen of St. Louis. He was also a Missourian, my friends, and he acknowledged his fealty to the Commonwealth by naming this unequaled Garden for the State of his adoption. It is the Missouri Botanical Garden, and it belongs as much to the citizens of this State as it does to the citizens of St. Louis alone. St. Louis is a part of Missouri; Missouri is

proud to claim St. Louis, Missouri takes an interest in St. Louis and takes pride in her progress. And if St. Louis but felt the same interest and extended the same courtesy to the State upon every occasion that the State does to St. Louis there would be that warmth of feeling, that fraternal regard which should exist between the country and the city and the absence of which we have for so long deplored. We are all Missourians; we feel proud of the State, and the very mention of the name of the Commonwealth should arouse within us a feeling of pride. We should take an interest in the welfare and the progress of this Commonwealth, and every man should feel it to be his duty to put his shoulder to the wheel and do what he can to increase the wealth and the glory of Missouri.

On behalf of the Commonwealth I am glad of this opportunity, Mr. Chairman, to pay tribute to the memory of the distinguished citizen in whose honor we are assembled this evening. He was a Missourian whose fame was not confined to the City of St. Louis nor, indeed, to the State of Missouri, nor to the United States. The presence of these distinguished guests this evening attests the estimate in which he was held by the scientific world; and on the part of the people of Missouri I desire to extend to those gentlemen a cordial greeting. And on the part of Missouri, also, sir, to say that we honor and shall continue to revere the memory of Henry Shaw.

The Chairman: The Governor has truly said, gentlemen, that the name and fame of Henry Shaw and of the institutions which he founded are not confined to the City of St. Louis or the State of Missouri. Will you allow me for a few moments to call your attention to some of the expressions of regret from those whom we had the honor to invite, but who were prevented from attending? I am sure that these tributes will be acceptable.

I read first a letter from Senator Vest, dated Washington, April 30, 1890.

UNITED STATES SENATE,
WASHINGTON, D. C., April 30th, 1890.

My Dear Sir: The very kind invitation transmitted by you from the Trustees of the Missouri Botanical Garden, inviting me to attend the Annual Banquet to be given on May 26th, 1890, in honor of Henry Shaw the Founder of the Missouri Botanical Garden and the Shaw School of Botany, has been received, for which convey to the Trustees my sincere thanks.

Nothing would afford me greater pleasure than to participate upon any occasion intended to honor the memory of Henry Shaw. He was a public benefactor, and his unselfish devotion to the people and city of St. Louis entitles him to their abiding gratitude. His simple and unostentatious life, and unpretending charity, can never be forgotten by those who know the full measure of his beneficent action towards those who had no other claim upon him than the common "touch of nature" which unites all mankind.

I became acquainted with Mr. Shaw more than thirty years ago, and his character and attributes always commanded my sincere respect.

There was much in common between him and Mr. W. W. Corcoran of this city. They were both types of that public spirit and genuine philanthropy which adorn and elevate humanity.

I regret very much that my public duties here will prevent my attending the Banquet, but I desire in the most public manner to add my tribute to the worth of Henry Shaw. Very truly, &c.

G. G. VEST.

A. D. CUNNINGHAM, ESQR.,
319 North Seventh St.,
St. Louis, Mo.

The Chairman then read the following letters, likewise received by the Secretary of the Board: —

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
WASHINGTON, D. C., April 29, 1890.

Dear Sir: I acknowledge herewith the receipt of the card of invitation to the Annual Banquet given by the Trustees of the Missouri Botanical Garden at the Southern Hotel in honor of Henry Shaw, the Founder of the Garden, and the Shaw School of Botany.

As it will be impossible for me to be present in St. Louis on the 26th of May next, I desire to thank you for the honor of the invitation and to express herein the high personal esteem which I held for Mr. Shaw dur-

ing his life and my feeling of honor and respect for him since his death. The people of St. Louis will hold in perpetual remembrance his kind and wise thoughtfulness for their good. The provision which he has made not only for their health and amusement, but also for their instruction through the Botanical Garden, will always commend the name of Henry Shaw to their gratitude. But there is no action of his out of the long list of good deeds which stand to his credit, that has appealed so strongly to my sense of obligation as his provision for a perpetual professorship of botany in connection with the chief educational institution of St. Louis. By this provision a connecting link is, as it were, made between the University and the Botanical Garden in such a way as to make the entire gift of the garden and professorship in its practical effects an endowment to the University.

In the centre of a vast agricultural region, here is an institution for laboratory work of the highest scientific and economical value in the study of plant life.

It is safe to predict that the future will see a large representation of specialists resorting to St. Louis to pursue the studies necessary for the promotion of agricultural industry.

I am very sincerely yours,

W. T. HARRIS,
Commissioner.

SMITHSONIAN INSTITUTION,
UNITED STATES NATIONAL MUSEUM,
WASHINGTON, April 26, 1890.

Dear Sir: The invitation of the Trustees of the Missouri Botanical Garden to join them in honoring the memory of its Founder is one which no scientific man would willingly decline.

For those who, like myself, cannot be present in *propria persona*, on account of their particular situation in space and time, will unanimously request to be regarded as present in the spirit and with the spirit which must animate all lovers of science on such an occasion. It would be superfluous, nay almost impertinent, for me to offer a personal opinion as to the services, past, present and to come, of Mr. Shaw, where so many who have had the privilege of knowing him are able to speak, but it may not be ungracious in me, as one who did not personally know him, to add my humble testimony to the regard and appreciation which his noble benefactions excite in minds which appreciate the wise generosity which saw its fullest opportunity in promoting the increase and diffusion of knowledge among men.

I am very sincerely yours,

WM. H. DALL.

ST. LOUIS, May 9th, 1890.

My Dear Sir: Your kind invitation in behalf of the Trustees of the Botanical Garden to the Annual Banquet is received. I thank them for

the compliment and desire to send my regrets that I will not be able to attend.

I cannot content myself with the mere expression of regret. I honor the memory of the late Founder of the "Missouri Botanical Garden" and "The Shaw School of Botany."

I consider him as one of the greatest benefactors of our State and the Garden as one of the proudest monuments that can be reared to the memory of a cultured citizen.

The city of St. Louis is greatly indebted to his large-minded beneficence, and there is no greater attraction to visitors than his wise foresight has provided.

He has gathered together in this inviting resort a beautiful illustration of the truth of the motto he has chosen for his mausoleum "How manifold are Thy works; in wisdom hast Thou made them all, the Earth is full of Thy riches."

Please convey this expression of my thanks to the Trustees.

Respectfully yours,

M. SCHUYLER.

STATE UNIVERSITY OF MISSOURI,
CHEMICAL LABORATORY,
COLUMBIA, MO., May 17th, 1890.

Dear Sir: It is with genuine pain that I inform you of my inability to be present at the Annual Banquet, in honor of Mr. Shaw, of the 26th of this month. The closing exercises of this University, beginning with the final class examinations on that day, would seem to render my absence at that time impracticable. I regret this all the more as my respect for Mr. Shaw while living has been increased since his death by that splendid monument, which his far-sighted sagacity has left alike to his memory and to science,— the Missouri Botanical Garden. His State will forever honor him, and as a citizen and a representative of this University, I beg to assure you of my lively interest in all the achievements of the Botanical Garden, practical as well as scientific, so full of promise and so well assured under its present management.

Very respectfully yours,

P. SCHWEITZER.

DALHOUSIE UNIVERSITY,
HALIFAX, NOVA SCOTIA, 2nd May, 1890.

Dear Sir: May I request that you will be pleased to convey to the Trustees of the Missouri Botanical Garden my best thanks for their kindness in honoring me with an invitation to the Henry Shaw banquet. I regret very much that duties here of an unusual kind will deprive me of the pleasure of being present on an occasion of so much interest, otherwise I would have cheerfully embraced the opportunity to join in doing honor to one who has done such signal service for botan-

ical science, and for humanity. Dr. Robert Brown, whose acquaintance during his later years I enjoyed in my youth, was characterized by Baron Humboldt as *facile princeps botanicorum*, not so much for the volume of work accomplished, as on account of the sagacity he displayed; and, in like manner, Henry Shaw may well be styled the prince of botanical patrons, not merely for the munificence of his gift, but because also of the wisdom shown in its disposal.

Permit me to express, what every true botanist must feel, my heart-felt desire for the prosperity of your institution.

I remain, dear sir, yours faithfully,

GEORGE LAWSON.

APALACHICOLA, May 9, 1890.

Sir: I am in receipt of your invitation to attend the annual banquet given by the Trustees of the Missouri Botanical Garden in honor of Henry Shaw, its Founder.

To honor such a benefactor of his race is not a pleasure merely, but a duty; and I have an added inducement in the recollection of pleasant personal relations many years ago. I wish it were possible to be with you, but the infirmities incident to a life of more than fourscore years are too great to allow me to undertake so long a journey, or to enjoy the pleasures of the occasion, if present.

Very respectfully,

A. W. CHAPMAN.

ALBION, ORLEANS COUNTY, NEW YORK, 24th May, 1890.

My Dear Sir: Ill-health keeps me still wholly retired here in Western New York. Were I able to travel, I should esteem it a pleasant privilege to accept the invitation to their Annual Banquet, with which the Trustees of the Missouri Botanical Garden have honored me.

In consequence of my absence from Washington, this favor has only now reached me. I trust, however, that my reply will prove seasonable enough to duly convey my appreciation and plead my sincere regrets, as

Yours truly & obliged

FRANK HAMILTON CUSHING.

LABORATORY OF CRYPTOGAMIC BOTANY,
CORNELL UNIVERSITY, April 30, 1890.

My Dear Sir: I regret very much, that my duties here will prevent acceptance of the invitation extended by your Board, to the banquet appointed for May 26th, 1890.

The first great patron of botanical science in America indeed deserves all the honor that can be shown his memory.

Very truly,

WILLIAM RUSSELL DUDLEY.

BOSTON SOCIETY OF NATURAL HISTORY,
BERKLEY STREET, BOSTON, MASS., May 3, 1890.

Dear Sirs: The undersigned regrets exceedingly not being able to be present at the annual banquet given in honor of Henry Shaw, Founder of your Botanical Garden and the School of Botany.

Such opportunities are of rare occurrence, and I always desire to take part in them whenever it is practicable, because I think it the duty of every scientific man to show that he feels grateful to the men who are willing to give for the benefit of science, and to found institutions which cannot but become centres for the encouragement of research and the dissemination of knowledge.

With great respect for your institution and its founder, I remain,

Cordially yours,

ALPHEUS HYATT.

VANDERBILT UNIVERSITY,
NASHVILLE, TENN., April 25th, 1890.

Gentlemen: I have the honor to acknowledge the receipt of an invitation to attend the Annual Banquet to be given in the City of St. Louis, May 26th, in honor of Henry Shaw, the Founder of the Missouri Botanical Garden and the Shaw School of Botany.

I highly appreciate the honor and the interest of the occasion, but regret to say that, owing to my engagements at the time, it will be out of my power to attend. It would be a pleasure to attend, and it is meet that all who can should join St. Louis in doing honor to the memory of Mr. Shaw. The benefits of his work and liberal gifts are not confined to your city or State. We in Tennessee and Nashville, in common with the whole country, feel their influence for good, and shall be ever grateful that Botany has had so generous and able a patron.

Respectfully,

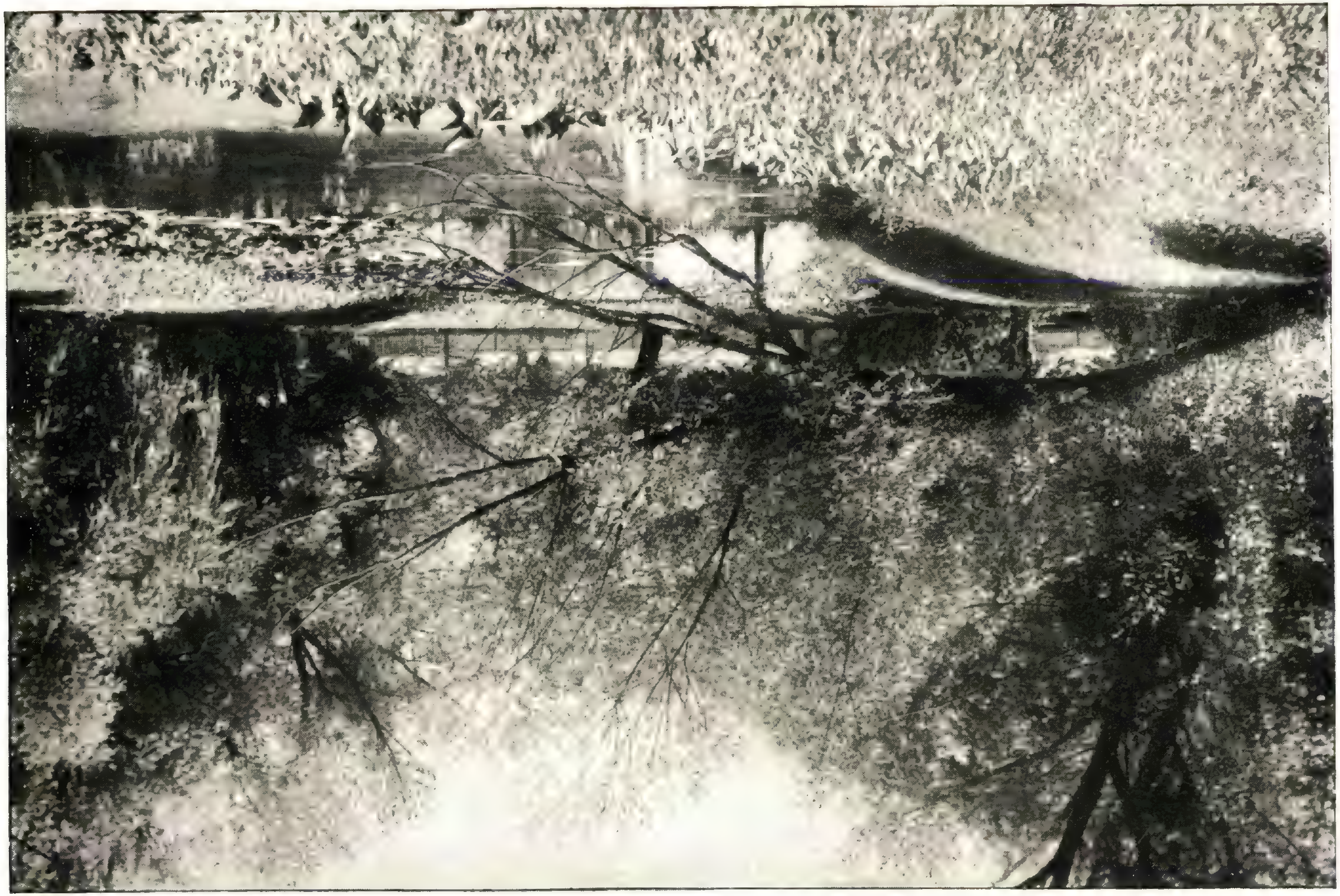
JAMES M. SAFFORD.

STATE OF NEW YORK,
OFFICE OF THE STATE ENTOMOLOGIST,
ALBANY, April 30, 1890.

My Dear Sir: I regret that it will not be possible for me to avail myself of your kind invitation to attend the banquet to be given on the 26th prox., in honor of Henry Shaw, the Founder of the Missouri Botanical Garden and the Shaw School of Botany.

It would afford me very great pleasure could I, by my attendance on the occasion, show, even in some faint degree, my profound veneration for the memory of the man whose delight it has been to make such princely provision for a continuance through all future time of botanical study, under perhaps the most favorable circumstances that could possibly be devised for its successful prosecution.

WILLOW POND IN THE ARBORETUM.



An endowment of this character will be universally acknowledged by every true scientist, not only as a beautiful and just tribute to Natural Science, but as an act, that in its broad appreciation of the value of science, has lifted up human nature nearer towards Him who made our beautiful world "and all that is therein."

I am very truly yours,

J. A. LINTNER.

WEST CHESTER, PENNA., May 6, 1890.

My Dear Sir: Will you be kind enough to thank the Trustees of the Missouri Botanical Garden for their invitation to be present at the Annual Banquet held May 26th in honor of the Founder: Henry Shaw.

Time and distance prevent my acceptance of the honor. I thank the memory of the founder for the impetus thus given to American botany: for the enduring basis upon which he placed his benefaction: for the example he has left to other men of means to be equally large-minded and liberal towards humanizing studies: and lastly for the possibility, thus provided, of having in our own land at least one such institution which shall compare favorably in size and productiveness with anything in Europe.

Believe me, sir, I am faithfully yours,

J. T. ROTHROCK,
Prof. of Botany in University of Pa.

The Chairman then called upon Dr. Farlow, of Harvard University, as follows: —

Gentlemen: The method and first step of all science, at least since the days of Lord Bacon, is to ascertain and classify the facts from which it may deduce general laws. There are various modes of conducting scientific investigations. I dare say you all remember the old story of the prize offered by some academy of natural history for the best description of a camei, and of the various methods adopted by those who competed for it. The story was first told, — I am afraid it was invented, — by an Englishman. At any rate, he said that among the competitors or the prize were an Englishman, a Frenchman, and a German. The Englishman went to Arabia, abundantly provided not only with ammunition, but every creature comfort and convenience, employed numerous native guides and

servants, hunted the camel to his heart's content in its native deserts, studied the animal and its habits at his leisure, and thus prepared his treatise. The Frenchman, reluctant to tear himself from the delights of Paris, hied him to the Jardin d'Acclimatation, found and studied the captive camels there, satisfied himself that nothing more was necessary, and wrote a treatise in which whatever may have been wanting in the way of natural history was made up by sparkling wit. The German scientist repaired to his study, and there, enveloped in clouds of smoke, evolved a description of the camel from the depths of his own consciousness.

From this story we learn nothing about the methods of investigation pursued by American scientists. But it is our good fortune to have with us as guest this evening, an eminent professor of the science of botany, who can give us such information. May I ask Dr. Farlow, of Harvard University, to tell us something about "The Botanist as an Investigator?"

DR. FARLOW.

Your invitation, Mr. Chairman to attend the meeting this evening gave me a great deal of pleasure, I assure you. I had hoped, when I arrived this morning, to be shown for the first time the Shaw Garden under the leadership of your Director. Unfortunately I missed him at the station and was therefore entrusted to the tender mercies of a driver. The St. Louis driver is probably like other drivers and I hardly expected to find here or elsewhere a person well informed in botanical matters in the shape of a driver. But I found on arriving at the Garden that this St. Louis driver was not content to take the fare he would have charged any of you, but insisted upon taking me into the Garden and describing the different objects of interest. He seemed to be perfectly familiar with the arrangements there and I was quite delighted with him, and I said to my-

self, "If the St. Louis drivers are so well informed about their Botanical Garden, what must the general public be!" For I supposed that the drivers were not so likely to be interested in the plants as the majority of the populace. Of course, there could be no doubt that the St. Louis people fully appreciate the Garden. It is a source of pleasure and instruction of the best kind, but, as a stranger, you will pardon me if I refer to one point which does not seem to me to have been touched upon by the previous speakers. One speaker before me has mentioned that the Garden has a local interest. Excuse me. It has a very much more than local interest. Why, only a short time ago, I had a letter from Edinboro'. The Professor there said "What a start they have at St. Louis!" Why, of course they have! He knew it as well as I did. A knowledge of the Shaw Garden and its promise for the future is not limited to St. Louis by any means. It has been known for years abroad, and the ample endowment you now have has fairly surprised everybody in America. No other Garden in this country has anything like the endowment which the Shaw Garden has, and not many in Europe can be compared with it. In a very admirable Book, we are informed that "where much has been given, much shall be required." Much has been given here, what shall be required? That St. Louis shall take the lead in scientific investigation. There is no doubt whatever that, with such an intelligent, such an active body of men as your Board of Trustees, the interests of St. Louis will be looked out for as far as the Garden is concerned. But the highest interests of St. Louis are the interests of the United States—they are the interests of the world. They are the interests of Science in general; and Science itself is more than local, it is universal, wherever man is found. Now you have here in St. Louis a Garden with an endowment far surpassing that of any other Garden in America, and possibly equalling that of the best Gardens in Europe, with a fund which may be and should be spent for the purposes of investigation.

What does investigation mean? It does not mean any thing which is of necessity capable of practical application at first sight. The investigator is a dull, plodding mortal, working away year by year. But at last he discovers something which is of benefit to all mankind. You should not hurry the investigator and say, "We must have a report in six months." "We must have a report in a year." "Tell us about this thing, about that thing, about the other thing." An investigator is one who knows what he is about, and he knows a great deal better than you do. He is one who has been trained, who has studied deeply, who is thoroughly in earnest. He is not one who is making money but one who is bound to discover the truth, and the truth is what we want.

The weak point of science in the United States has always been not that we have not energetic men, not that we are without talented men, but that the men are not allowed to turn to abstract study for the simple reason that the American mind does not encourage abstractions. But we know what Newton did. Gravitation was an abstraction. The germ theory also was an abstraction, and we know what practical results have come from abstract studies in these cases. Here in St. Louis, better than anywhere else, you are provided for doing abstract work. Trust to research. Do not be afraid to go ahead and leave to investigators the work which, in the end, and perhaps in a comparatively few years, must give your Garden a prominent place amongst all the Gardens of the world. Do not be content to say, "We of St. Louis have here a beautiful Garden, where we can go every day and examine the plants and appreciate the beauties of nature," but do not rest until you have established here a school of research, research in the most difficult problems of botany, being assured that in the end those problems will be of advantage not only to St. Louis, to Missouri, but to the whole world. Once having made in St. Louis a school of research, you will then take the lead in practical horticulture as well as in more purely

theoretical science. You already have at the head of the Garden one qualified to lead in research. I have the good fortune to know your Director. I have known him for a number of years and I feel that you have got entirely the right man for the place.

Now, I am perhaps a little heretical on one subject. Not heretical in the light in which you would regard the subject, but in the way in which a college professor may be supposed to form his opinion. It has been said that a business man does not know anything about science. He knows about making money and that is the end of it. But there is one thing he can know; — that he does not know how to manage the details of science but must select proper men to manage them. Now, you have this evening commemorated the beneficence of Mr. Shaw. He was not only beneficent — many men are beneficent — but I hold beneficence, great as it is, as doubly great when combined with an intelligence like that of Mr. Shaw. Mr. Shaw knew what he wanted. He appreciated Nature, he observed the beauties of plants with a reverent spirit, and he saw that there were scientific problems which needed to be studied and he recognized that he did not know how to manage those problems himself. To aid in the development of his plan, years ago he associated with himself Doctor Engelmann.

Now, to digress for a moment right here. St. Louis, in the East, is called a new city. As far as science is concerned it is not a new city. In science there is no city in the West that can be compared with St. Louis. For many years St. Louis has been the home of scientific men of marked reputation. Doctor Engelmann, it was my privilege to know. Trained in foreign Universities, the intimate friend of leading scientific men of both hemispheres ever since he settled in this city, more than fifty years ago, he pursued science for its own sake. The demands of his profession gave him but comparatively little time, to be sure, but in that little time he accomplished a remarkable amount of first class work. Too great honor

cannot be given to the pioneers of science in this city of St. Louis. The pioneers of learning in the West were here — they were not to be found in other cities at all. Now, Mr. Shaw, as I say, early associated himself with Doctor Engelmann, and afterwards with Doctor Gray. He knew what he wanted and that, of all persons of scientific training, Doctor Engelmann and Doctor Gray were best capable of forming a plan for the detailed elaboration of his great purpose. In Mr. Shaw's will, which I regard as a great model of clearness and far-seeing scientific perception, he has made provisions for plans he had in view. He distinctly says that the Garden is not only to be a place of recreation and instruction for the public, but also special botanical research. You have a person to my knowledge amply capable of carrying out research in its best form and, as you have done me the honor to suggest that I should be, in a sense, an advisor, may I offer simply this advice, which I think you will not neglect to follow. That is, to keep right on as you have begun; go right ahead and do not be afraid, no matter what people say, to insist upon research. You have your garden for the public, you also have the means of research, and in ten years, in twenty years, in thirty years, by constantly pushing onward, you will be in a position absolutely above all ordinary establishments in this country. Perhaps you may be even the leading establishment in this country, for I am sure that there is no University having anything like the endowment which has been given to the Missouri Botanical Garden by Mr. Shaw.

To the next sentiment the Hon. Norman J. Colman was asked to respond, as follows:—

You will remember, gentlemen, that in the will of Henry Shaw he speaks of botany not only in the sense or with the meaning which perhaps includes all that many of us find in that word,— that is, a knowledge of plants sufficient to enable one to pick a flower to pieces and explain in an interesting way, to a class of young ladies, how many pistils

and stamens it has and what sonorous Latin name it bears. Much more than this, as Dr. Farlow has said, Mr. Shaw recognized in the science of botany. He desired to promote the study and development of that science in its broadest relations. One direction in which he expressly provides that investigations shall be made is in respect of the relations of botany to agriculture.

Among the guests whom the Trustees have the pleasure of welcoming this evening, is a citizen of Missouri, who, besides holding important public office in this State, and in the United States, has devoted many years of his life to the promotion of farming interests and the intelligent study and pursuit of agriculture. Appointed by President Cleveland to the important office of Commissioner of Agriculture, he became, towards the close of that administration, the first Secretary of the Department of Agriculture, then newly established by Congress.

I have great pleasure in calling upon the Honorable Norman J. Colman to respond to the sentiment,— "Botany, in its relation to Agriculture."

COLONEL COLMAN.

Mr. Chairman: At this late hour of the night, I feel that it would be quite out of place for me to make any protracted remarks, and I shall be very brief indeed in what I may say. I have been led to ask myself, as I have listened to the very appropriate and able speeches which have been delivered, if he who has caused two blades of grass to grow where only one grew before should be called a public benefactor, what higher title and honor should not be given to him who has caused thousands of blades to grow where only one grew before, who has collected from the four quarters of the globe the most beautiful trees and shrubs and flowers which were native there, and brought them here and planted them and nursed them and left them as a legacy

for all time to the people of St. Louis, to the people of Missouri, and of the Nation.

A little more than half a century ago, a young man came to St. Louis and cast his lot with our people. With but a small capital he commenced business and, by close attention to that business, was successful. All of his spare hours, as he has told me himself, were devoted to the study of botany. He loved trees and flowers with a devotion which he could not overcome. And he determined, even soon after locating here, at some future day to establish a Garden which should be a pleasure to every person who should visit it as well as to himself. Unlike other business men, when the cares of his office and the duties of his business were over, he gave himself to his books, to the study of botany, and mastered that most difficult, that most interesting science. He collected all of the indigenous plants which it was possible for him to secure here, and sent abroad for other choice trees and plants, spending his means, devoting his time, to the collection of what we now have here, which is so great a credit to the City; and the Botanical Garden which bears his name has not an equal upon this continent and but two or three that equal it in the whole world.

What an example has Henry Shaw set to the young men of this country! With his own mind, with his own hands he carved out his fortune. Instead of wasting it, as many do, he spent it for the good of the people of St. Louis, for the good of humanity. He loved flowers and that love is an innate love of man. History teems with the description of gardens from the earliest ages of man. Even biblical history tells us that Adam was placed in the Garden of Eden. This love for flowers, this æsthetic, finer nature, needs more attention, needs more culture than is usually given it. And we have advantages here in this city in that respect possessed by few others, and yet, gentlemen, this is but the foundation. Mr. Shaw has simply laid the foundation. What will not this garden and this magnificent park a hun-

dred years from now, or a thousand years from now, be in comparison with what it is to-day! It is left as a legacy to the public for all time, it is a school of instruction, and I believethat this work will go on and on with increasing vigor. I believe that we have a Board of Trustees that will devote their time, that will devote their energies, to carry out the wishes, to carry out the trusts which Mr. Shaw so wisely reposed in them.

I have not time, Mr. Chairman, to speak of this matter in its scientific relations to agriculture. It is well known to every botanist here that we can now breed plants with as much certainty of improvement as we can breed domestic animals. The knowledge of the science of botany has given to man the power to improve the varieties which God has given us, and they have been improved. Even our fine pippins had their origin in the crab-apple. Van Mons spent a great many years in the improvement of pears and succeeded in obtaining hundreds of new varieties by cross-fertilization. These gardens here are a school of instruction. They are an experiment school. We have had lately given us at Washington six hundred thousand dollars for the establishing of experiment stations in each State, each State receiving but fifteen thousand dollars for that purpose. What is that in comparison, gentlemen, to the magnificent endowment of Henry Shaw?

There is one more point and I will close. As I have traveled through this park with my farmer friends I have frequently been questioned as to what is this tree or that tree or the other tree. Other persons have visited these grounds and have endeavored to describe certain trees to me to ascertain what they are, and I have been sorry to see that one very important part has been neglected, which I hope in the near future will be changed; and that is the labeling of every tree and every shrub, so that the humblest farmer, the humblest citizen who visits those grounds, if he sees anything which strikes his fancy which he wishes to procure and take to his home to adorn it, may know just

what it is, so that he may get it at one nursery or another. But the lateness of the hour, Mr. Chairman, will prevent my speaking any further.

Mr. Colman having concluded his remarks, the Chairman said:—

I am very glad, gentlemen, that Mr. Colman so frankly mentioned what has occurred to him in visiting the Garden, because it gives me the opportunity to say that, at the suggestion of the Director, the Trustees some time ago gave directions that every tree and plant in the Garden should have affixed to it a suitable label, for the very purpose to which he has referred.

Mr. Shaw's will, you will remember, designates as the guests to be invited at this annual banquet, literary as well as scientific men, friends and patrons of the natural sciences. That duty we have endeavored to fulfill, and with very gratifying success, —though not all that we hoped for, for our desires and expectations are very extensive. It is quite evident that in his thoughts there was no trace of that ancient prejudice, not yet absolutely extinct, in virtue of which it was once supposed that there was some kind of conflict between Literature and Science. Men of culture, in this day, occupy broader ground. They know that between literature, or what used to be called "the humanities," and science, there is no opposition. Like the Muses of old, they are sisters, harmonious in their different spheres. The universities of our own country not only recognize the value, indeed the necessity, of scientific instruction, but are including scientific schools among their departments. We have the pleasure this evening of welcoming among our guests a gentleman who represents perhaps particularly the literary branch of culture, — the President of Randolph-Macon College of Virginia. And I shall ask Dr. Smith if he will be kind enough to illustrate for us the fact that literature and botanical science are nearly connected, that they sometimes have a very intimate and

practical connection, by telling us something about the *Betula alba*, commonly called, I believe, the white birch.

DR. SMITH.

Mr. Chairman, and Gentlemen: A happy accident has put me in position to accept your very kind and courteous invitation to be present this evening, and I have enjoyed these exercises more than I can tell; because I have not only been entertained but greatly instructed by the addresses and remarks that have been made in connection with the various toasts that have been proposed to-night. I confess, however, that my pleasure in hearing the last address or two has been diminished or disturbed more or less by the fact that I have been notified by the President that I was to be called upon to say something myself on this occasion, and I have been casting around in my mind to find some point of connection —how I, not specifically a botanist, but only a pedagogue, might get correlated with the situation, as it were, in this learned company. I have been helped in this search for a nexus by the statement which your President made when he said that it was a part of the purpose of the founder of this institution to promote arboriculture. I was further relieved when Doctor Trelease said that it was the purpose to make the investigations at the Garden practically useful, and now I am prepared to stand before you as a teacher and as representing teachers with a worthy subject, the merits of *Betula alba*, and to ask very earnestly that my friend Dr. Trelease shall not neglect this teacher's friend, the old-time birch. I desire also to impress upon my friend, the Governor, and I am very glad that I have the opportunity of addressing this directly and personally to him, that much more of gratitude is due to *Betula alba* from our statesmen than has ordinarily been given to her. I stand in defense of her claim that upon her rest the foundations of the State. For, sir, it will be admitted that our republican institutions rest upon our schools; who will deny that? That the maintenance of our schools rests upon the

authority of the teacher; who will deny that? And that the authority of the teacher lodges at last in *Betula alba*, and who will deny that? Thus we see that there is at once a fundamental need that this Garden which is to stand as the representative institution of this country in this particular line, shall not neglect the culture of the most indispensable *Betula alba*.

My own acquaintance with the practical application of arboriculture to pedagogy commenced in my very early years. I remember, sir, — I remember it very distinctly, — when at a very tender age, *Amygdalus Persica* was applied to my personal anatomy. I called it peach switch then, but it was to *Amygdalus Persica*, applied by maternal hands, that I owed many resolutions of filial duty. I remember, sir, when I advanced to the greater dignity of *Betula alba* in the hands of a stalwart male teacher. But when, sir, as a sturdy youth, my progress in robustness of form and persistency of will was such as to demand the application of *Carya alba*, the redoubtable hickory, I graduated, sir, with college honors!

I confess that I viewed these gifts of nature at that time from an opposition stand-point; but since I became a teacher, I have changed my point of view, —swapped ends, as it were, — and have learned to look upon them as the essential foundations of modern civilization.

The poet has sung of *Betula alba*. I may be allowed, perhaps, to quote from one of our poets, who has addressed the country upon the duties and the character of the pedagogue, in language antique though in modern times. He says — you will remember our American poet, Saxe —

"Righte lordlie is ye Pedagogue
As any turbaned Turke;
For, welle to rule ye District Schoole,
It is no idle worke.

"For, as 't is meete to soak ye feete,
Ye ailinge heade to mende,
Ye younker's pate to stimulate,
He beats ye other ende."

And I tell you, sir, that there are times, as the poet goes on to remark, when even *Betula alba* fails, and when nothing, sir, short of *Carya alba* will suffice; for

"Sometimes he heares, with trembling feares,
Of ye ungodlie rogue
On mischieff bent, with felle intent
To licke ye Pedagogue!

"And if ye Pedagogue be smalle
When to ye battell led,
In such a plighte, God sende him mighte
To breake ye rogue his heade!"

And I add, for such emergencies, may Doctor Trelease ever keep for us an adequate and accessible supply of *Carya alba*.

But, gentlemen, *Betula alba*, noble and great as she is, has had her enemies, her rivals. Even in classic times I remember that Juvenal says,—a man of some authority, though I will not admit the greatest,—*Manum ferulæ subduxi*, or words to that effect. But I am glad to be able to appeal from Juvenal to a higher and wiser authority against this unworthy rival, the ferule; for, is it not written in the works of the wisest of men and one who "wrote of all trees, from the hyssop that springeth in the wall to the cedars of Lebanon," an authority, I may say, pre-eminent among botanists, that he that spares *Betula alba* will spoil the progeny of his loins? But a new peril has arisen in these modern times, and I pause, gentlemen, to ask your earnest consideration of this danger. I do not know that I can present it to you more forcibly, if you will allow me, than by an incident that has recently been related to me. It has come with all the evidences of authenticity from across the water, and it shows, gentlemen, the persistent malevolence with which our British cousins are ever seeking to undermine American industries, even to attacking *Betula alba* in her own home. The Queen of England, a lady who, you know, is sedulously desirous for the education of

her children, requires, it is said, the professors of Eton College, when she is at her Windsor Palace residence, to give instruction to the members of the Royal family. Among those members was the bright, delightful and accomplished Princess Alice, and among her teachers was the solemn Doctor Hicks, a trifle more stately and dignified than the ordinary English head-master, and that is saying a great deal. It is said that upon one occasion, Doctor Hicks crossed the Thames, strode up the long avenue of elms, was ushered into the royal apartments and proceeded to give his instruction in mathematics to his pupils. Before him, with the other members of the royal family, was the Princess Alice, crouched up in her seat, with brow contracted, now and then erasing from her slate the figures that she had made, illustrating the axiom that there is no royal road to learning. At last she looked up from her place and, addressing the presiding officer, exclaimed, "I say, Hicks, I can't get this thing!" "Hicks! Did that child call me Hicks?" With difficulty restraining himself, he at once asked for an audience with the Queen and was promptly shown into her boudoir. Immediately she arose and said, "Doctor Hicks what can I do for you?" "Your Majesty," said he, "I have been insulted. Your daughter Alice has insulted me." He then detailed the circumstances, and the Queen sent for Alice, and at once addressing her, said, "Alice, my daughter, I am surprised that you should ever forget that you are a lady." Administering a severe reproof, she concluded by saying, "And now, if ever I hear of you in any way showing disrespect to your teachers, I shall send you to bed." Note that, gentlemen,—"I shall send you to bed." Not "I shall apply *Betula alba*," the proper corrective, nor even "I shall apply *Amygdalus Persica*," but "I shall send you to bed." *Cubitus* has arisen as a new and dangerous rival to *Betula alba*, and that, too, from the British possessions. The Doctor smoothed his ruffled plumage and retired. His step was more stately than ever. Royalty had been taught a lesson

of respect and reverence to age and learning, and as he returned to his home it was in the full consciousness of victory. The next day he returned to give his accustomed lessons. Of course, there was added majesty to his demeanor, there was conscious authority and victory in his eye as he walked up the long aisle; the flunkies bowed lower than ever, the doors were flung open to him, and, as he entered the hall from the upper end, there came tripping down gracefully to meet him, courtesying humbly as she came, the Princess Alice. The Doctor rejoiced at the completeness of his victory. But lo! as she reached him, bowing low but looking archly up, she cries out — "Good morning to you, Hicks. How are you to-day, Hicks? I hope you are in a better humor to-day than you were yesterday. And now, old Hicks, good-night, for I am going to bed." Now, don't laugh the wrong way about that, for I am afraid your sympathies are with the Princess Alice instead of with Doctor Hicks.

But, gentlemen, let us not forget the serious side of this matter. In addition to the defeated aspirants for the lawful honors of *Betula alba*, the ferules, raw-hides, rattans, straps, *et id omne genus*, there comes direct from the Court of England, backed by British authority, — and who will deny by British gold, — this new and ignoble competitor, endeavoring to supplant the products of our American forests. We have stood such things as long as we may, and now I appeal to you, gentlemen, in the name of our country, to protect *Betula alba* from all foreign importations, from the rawhide of South America, the rattan of India, the ferule, come whence it may, and especially from this last innovation of an effete and, I may say, a bed-ridden monarchy; and I ask in behalf of the cause I seek to uphold, that the Trustees of the Garden join hand in hand with the educational associations of the State and, appearing before Congress, demand a prohibitory tariff against this and everything else, for the protection of our native and all-powerful *Betula alba*.

The closing speech of the evening was made by Dr. James Hall, the Director of the Cabinet of Natural History of the State of New York, who was thus introduced by the Chairman: —

It has been very pleasant to us who live here, to be told by those who know whereof they speak that St. Louis is reckoned one of the older cities of this country, so far as the pursuit and promotion of natural science is concerned. Not many years have passed, as nations count years, since virgin forests, penetrated only by the wandering savage, covered the ground now occupied by many miles of well built streets, the busy haunts of industry and traffic. Even during Mr. Shaw's active business life, before he conceived the plan which during forty years afterwards he was engaged in carrying out, the idea of founding, in the Far West, a Trust like this for the promotion of botanical science, would have been considered, if considered at all, as something which belonged to the far distant future.

And yet, gentlemen, we are gratified this evening by the presence of a student, let me rather say a master, in natural science, who first visited the then distant West, fifty years ago, as a student of natural science, and whose long life has been devoted to its pursuit. Dr. Hall, the Director of the Cabinet of Natural History of the State of New York, has not only done us the honor to come a thousand miles to be present on this occasion, but has kindly consented to tell us something of his own experience during those years through which he has watched the growth and aided in the development of science in this country.

DR. HALL.

Mr. Chairman and Gentlemen: After all the good things have been said, what can I say? After such an eloquent appeal in favor of *Betula alba*, one of my early acquaintances, perhaps even before I studied botany, I can only, as

an offset, mention an anecdote connected with Princeton College a full century ago, when Rev. John Witherspoon was President of that institution. It was then the practice to apply *Betula alba* and also the *ferula* when it was considered necessary, and one day the President coming into the Latin teacher's room found him with one of his boys laid upon the form (the desk) and administering *a posteriori* the *ferula*. "Tut, mon!" said the President, "what are you doing?" "Oh," the other replied, "this boy is lazy. He doesn't get his Latin lessons and I have great trouble with him; more than with all the rest of them." Whereupon the President replied, "Tut, Tut, mon! ye'll never bate the Latin in that wa'!"

I did think, gentlemen, at the beginning of this banquet, that there was something I might say, and it occurs to me now that a few words comparing the present and the past would be appropriate to this grand occasion: — the celebration of an event which makes an important epoch in your history, the results of a most munificent bequest, which places your city and state far in advance of any other. I wish to compare the conditions now existing for scientific study and teaching in this "far West," which I knew almost as a wilderness fifty years ago, with the conditions which existed in the East during my boyhood. After passing through the ordinary school, or even while I was still an inmate of the ordinary school, such as existed in New England at that time, and in Plymouth County, Massachusetts, I there received my earliest education. Doubtless I have forgotten much of *Betula alba* that was vivid to me then; we often forget our pains in the pleasures that follow, and I dare say, I have forgotten most of the ministrations of that beautiful tree which grows in our forests and which we utilize in many ways!

I was fond of nature, infatuated with nature. I could not go from my father's house without bringing back shrubs and flowers. I appealed in every direction for some information, some instruction which would give me a clue

to the names of the flowers and shrubs. I knew from my reading, even though a boy, that there were names to flowers, that they had botanical names, that they had names by which they could be known everywhere. I appealed to the teacher of my academy, a graduate of Harvard University. Begging the pardon of the Professor just speaking, there was at that time no regular professor of Botany in Harvard University, and I appealed to the teacher of my academy, who was a graduate of that college, in vain for some instruction which would teach me the names, or the manner or mode by which I could learn the names of those plants which I was so interested in collecting, but it did not come to me; it was not to be had. And later on, watching for everything which would give me a clue, any information in regard to nature in every one of its aspects, I saw that there had been established in the State of New York a school with the modest title "For the Teaching of Agriculture and the Mechanical Arts," established by a man who held large landed possessions; the Honorable Stephen Van Rensselaer, patron of the Van Rensselaer Manor. This gentleman, feeling that his tenants were not as intelligent as he would like to see them, himself a correspondent with scientific men and scientific societies over Europe, saw the desirableness and even the necessity of beginning some foundation for a more practical system of education — and if you will look at the records of our State of New York from about 1790 onward to 1817, you will see that agriculture, manufactures and the mechanical arts were uppermost in the minds of all intelligent men. Science had hardly a name. And yet this school established for the teaching of agriculture and the mechanical arts became the source of science teaching in this country. The students of this school, under the direction of a professor, — not such professors as we now have, because there were none in America, — were permitted to go to the farmers' fields to watch the growth of vegetation, to do what they saw fit in regard to the plants that were growing; in that par-

ticular making of certain farms that were allotted to the use of the school, experiment stations. And there, gentlemen, I think, in the neighborhood of Troy, in the establishment of the Rensselaer School, were the first agricultural experiment stations. But, unfortunately, the farmers complained that the experiments were too expensive and after a few years it was prohibited. However, the principal of this school himself inherited a love for science in every one of its departments, having given scientific lectures over the country of New England and some parts of New York, and had infused into men of ordinary pursuits a love, and a respect for science which has hardly ever been equally true of any other people or country. A very excellent friend of mine, a lawyer, who died a few years ago at the age of seventy-eight, listened to a course of lectures by Professor Eaton when he was a boy in Hudson and through the influence of that love for science there engendered, and having been a State officer, and in various public positions, always gave his countenance and help to scientific pursuits.

This school, established as a school for the teaching of agriculture and the mechanical arts, became a school for the teaching of botany, mineralogy, chemistry and geology under the auspices of this patron of science. A geological and agricultural survey of Rensselaer County was made, as also of Albany County, and the results were published about 1823 or 1824. Immediately upon the opening of the Erie Canal, a survey of the entire length of the canal was made by this Professor Eaton and his students, under the patronage of Stephen Van Rensselaer, bringing out the results as far as it was then practical in the way of geology and agricultural botany, and other facts in science, in a volume published in 1824. Now, that was my knowledge of the beginning of scientific work in this country, as I had derived it mainly from newspaper reading in my boyhood.

I ought to have said that, failing in every way to be taught the elements of any one of the sciences, I made my way to Cambridge and found there were courses of lectures

on mineralogy ; but that did not meet my wants. I then, in despair of acquiring knowledge nearer home, walked across the country from Boston to Troy, leaving Boston on a Monday afternoon, after bidding good-bye to my friends, and arriving at the Rensselaer School on Saturday night. There I had the pleasure of spending five years of my life as student and teacher and I saw there what could come out of very poor surroundings. We had one building only, a brick building, substantial, to be sure, upon which was painted the sign of the school. Our laboratories for botany, for chemistry and for mineralogy and geology were mere sheds, in fact no better than sheds in their external appearance. But every one of those students who entered there became imbued with the soul and spirit of science and no student ever came within the influence of Professor Eaton, the principal of the school, who did not come out at the end of his course permeated with the love of and a respect for science and a desire for its advancement. Every lesson or recitation was in the form of an extemporaneous lecture giving the student's own knowledge of the subject, and not a recitation from books. Even the man whom you have spoken of, the great botanist of our country, Professor Gray, received his first instruction through the influence of the Professor from whom I received my first instruction at the Rensselaer School; not at the school, but indirectly and elsewhere. And Doctor Torrey, who was our greatest botanist, before Dr. Gray, also received his direct instruction from Professor Eaton, the first principal of the Rensselaer School in Troy.

These, gentlemen, were some of the beginnings of science. It seems a very long way to trace its history from that time, when it was difficult to even acquire the elements of the knowledge of botany, to a period when you have here, from this grand man, a bequest more comprehensive in its purpose than any which has been made in any period of the world's history, I believe!

Because botany has not been the pursuit of my life, it

does not the less interest me. The first years of my student life at Troy were spent in the study of botany, only, however, to study it superficially, to learn the names of the plants, to learn their relations to other plants, and finally, as I began the study of medicine, to know something of their medicinal qualities. I performed many experiments upon myself during those years in which I was devoted to botany, and the happiest years of my scientific life were those in which I followed this pursuit of botany, giving me more pleasure, more satisfaction than anything else I have ever done in the same length of time subsequently.

Botany in those days extended very little farther than the knowledge of the natural relations of plants, the one class to the other, or the one set of species to another. Very little more than that; and in the course of two years I had accumulated a herbarium of 900 species of native plants growing along the Hudson Valley within a radius of ten miles around Troy. That botany had become a popular study in the schools may be inferred from the fact that eight editions of Eaton's Manual of Botany, based upon the "Artificial System", so termed, had been published almost before the text-book of Dr. Gray, based upon the "Natural System", had found its way into the schools; Eaton's latest edition, being only a year or two after the first publication of Gray's Elements of Botany.

But a bequest of this kind is farther reaching than perhaps you will consider when you look at it only in its relations to botany. Every department of science in America has progressed so rapidly that it is scarcely possible to take note of the progress which has been made. Leaving botany for geology, I have known your country, even this locality of St. Louis, just 49 years ago, as a city of less than 20,000 people. I made no acquaintances here, I believe, at that time. I was making a geological exploration of the country between New York and the West, the Mississippi River ostensibly. Years later, I become acquainted with

your scientific men; about 1850 to 1855. And when I look at this magnificent bequest for science, I can only recall how earnestly these men were working, how untiringly they struggled for success. The geologists and paleontologists of your latitude have left comparatively little of tangible record in the way of collections to mark their own time. Only one of my own friends, Doctor Engelmann, can be said to have his memory perpetuated in this grand bequest of Mr. Shaw. Nevertheless, it is impossible, gentlemen, to separate one science from another. The sciences must go hand in hand. You will put into the organization of your Botanical Garden some men, at least, with a knowledge of chemistry as well as of the geological relations of the soils, because it is absolutely impossible for an individual or a school to know on what soil to grow plants successfully and to improve their condition unless he knows something of the composition, the chemical nature and geological origin of that soil.

Now, it is too late to more than suggest what ought to follow, — what I think should follow such a bequest as this. You live here, gentlemen, in a city whose magnitude is so far beyond what one could have expected forty years ago that it seems to dominate the West. It will not be long before your city will be the greatest city in the West. You have this one grand thing, a Botanical Garden and a School of Botanical Science. Now, will you, gentlemen of St. Louis, allow the Botanical Garden, which every one loves and admires, so far to absorb all interests that you will forget other sciences, your geology and mineralogy, — features more directly important in their commercial and economic aspects, — will you forget these? And I want to say one word here in regard to your Geologist and your geological survey. It may be a little out of place, but it has come directly to me in this way. My acquaintance in St. Louis in 1850 to 1855 shows that you had here one botanist preeminent; it showed also that you had several geologists and paleontologists, Doctor Prout, Professor Shumard and some

others. These have gone and so little is left to mark their work that I am sorry to say it is scarcely creditable to those who have followed them. I have been examining these collections myself for my own purposes of knowledge and I am sorry to feel that your collections in that direction are barely as good as they were forty years ago. You have a geological survey; you have had a geological survey before, and I ought to say, perhaps, that my experience in the geological survey of the State of New York, if it does not give me the right to speak, gives me an opinion which I cannot very well help expressing. We in New York began a geological survey in 1836. The report of the Secretary of State proposing an organization of that survey was made in 1835. In 1834 the Albany Institute, in which at that time were some prominent men of science, as science was then known, passed a resolution of this kind, recommending that a law be passed which shall result "in bringing together under one roof all the natural productions of the State of New York." Now, that was attempted to be carried out; our survey was carried on for a few years and terminated with the appropriation and fitting up of the old State Hall, or the building which had been occupied by the State officers for fifty and more years, for a geological and Natural History Museum. This building was appropriated to us, and an attempt was made to bring in specimens of all the materials which should express anything in relation to the natural products of New York; all the plants, all the animals, all the minerals, whether interesting only in a scientific aspect, or interesting in their economic aspect. This work has not yet been finished. It may be accomplished some time in the future; but what I would say is that by this course we have preserved the tangible evidences of what was accomplished during the four years of the geological survey. You have had a geological survey in this State, but I understand the materials have never been brought together in any public building. In several other States the same thing has happened. The materials collected by the surveys, so

far as all practical use of them is concerned, have been lost. Now, to a man who is a cosmopolitan as I am, with no prejudice for East or West, or for one part of the earth over another, and from what I know of the resources of Missouri, and which I have known in a general way for more than forty years, it seems to me that they should no longer be neglected. It is the duty of the authorities, of the Legislature of the State of Missouri, to erect a fire-proof building, where all the natural products of the State of Missouri can be brought together under one roof; that you should not go on with your geological survey for a few years only, your materials collected to be poorly housed and finally lost. Go on with the work so long as new facts and new knowledge can be acquired from the investigation; adding yearly to the stock of information which will increase the general intelligence of your people, and give them a true appreciation of the resources of this great commonwealth. Science is truth; and the workers in science are looking for the truth. Indirectly we give you commercial advantages, coming from our knowledge — economic advantages, I should say, and it is not a fair thing toward men of science to neglect the preservation of the records of their work; for if this work is not made of economic importance, it does not come home to you in any direct way.

It is true the results of these investigations do come to us in a greater enlightenment and cultivation by entering into our sources of education and in becoming a part of our life. Your streets, your houses and public buildings are lighted here by these electric lamps, your cars are moved upon the street by this same power. A few centuries ago the men who were experimenting with electricity were ridiculed, but you have now the practical results. It is your duty, I say, not only to your State but to those who would come to your State to invest their capital in economic workings, or to live among you as intelligent and cultivated citizens, and above all as an inheritance for your children, that you should have a place where all the resources of your State can be exhibited under one roof.

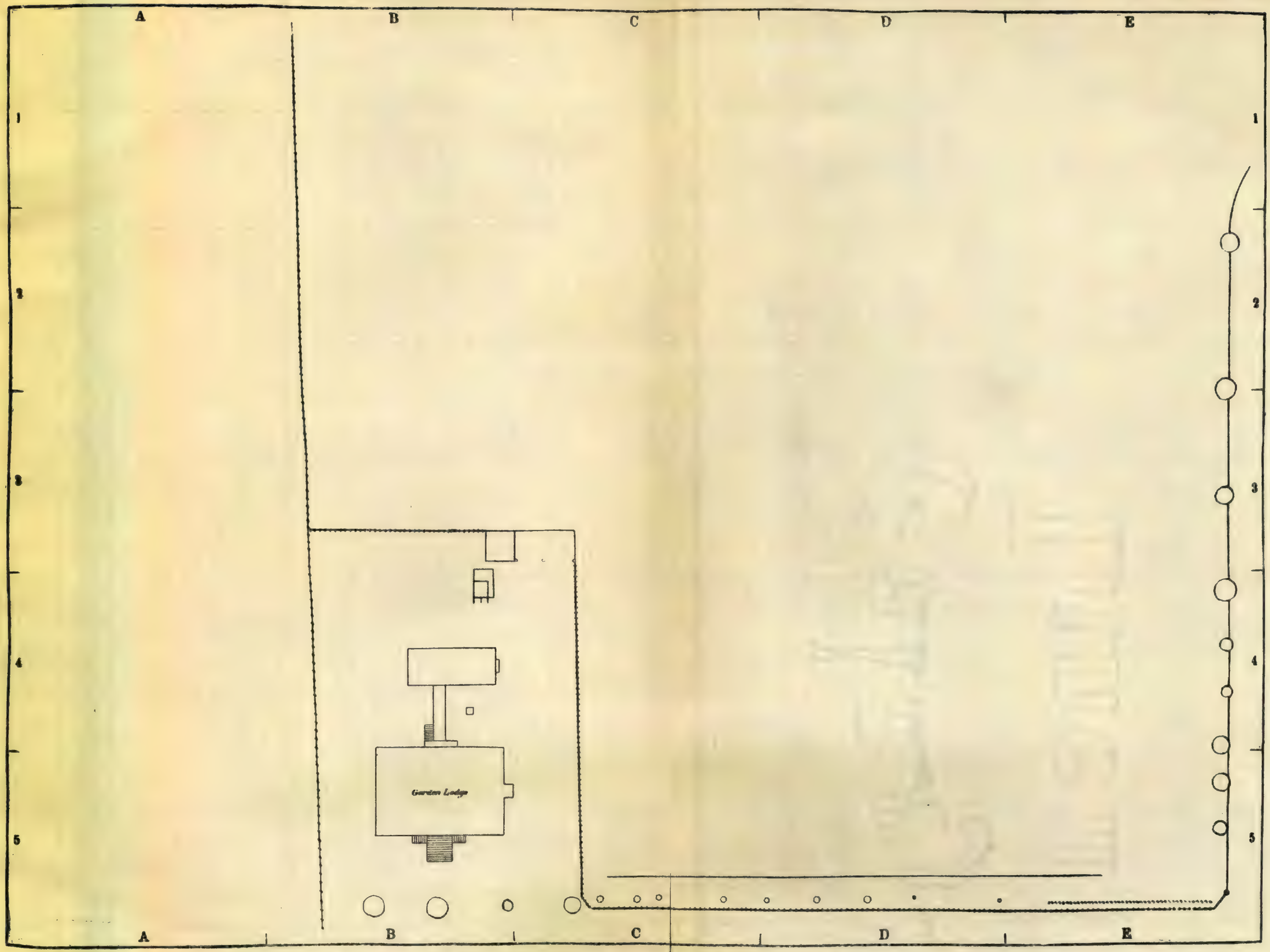
The Chairman: Gentlemen, but one word remains, — a word of grateful thanks on the part of the Trustees of the Missouri Botanical Garden for the kindness and courtesy of your presence: especially, — and in this I speak not only for the Trustees, but for all our St. Louis friends, — to those who have manifested their interest in this institution by coming so far and so kindly taking part in this occasion. Let us all hope that this shall be but the first of many Annual Banquets, at each one of which shall be noted constantly increasing progress in the promotion of science and knowledge, with which the name of Henry Shaw, among those of other benefactors of the human race, shall be inseparably connected.

MAP OF THE GARDEN.

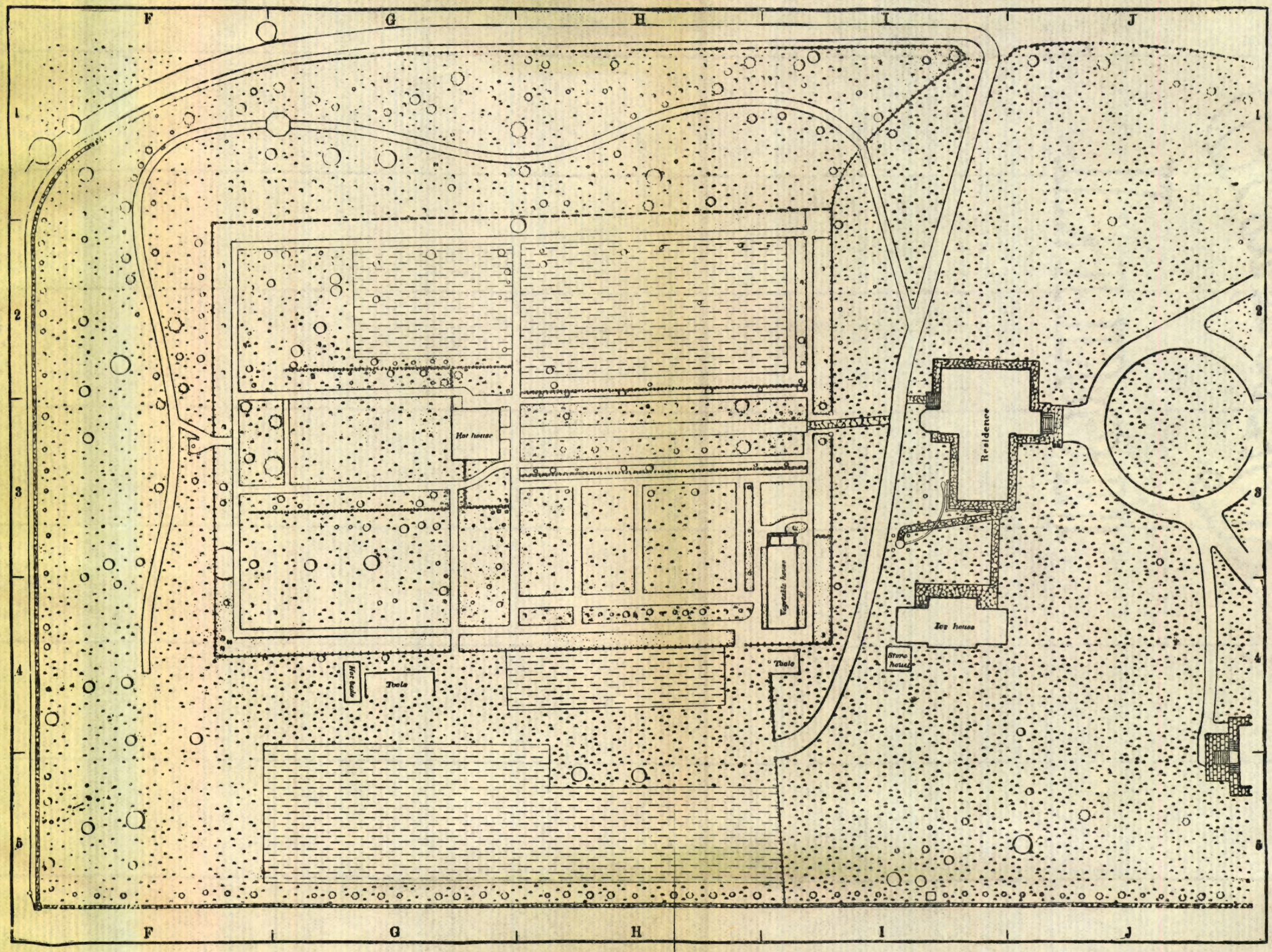
(Scale 1 inch to 60 feet).

The following sheets, representing one-fourth of the grounds including the Garden, are reduced from a map executed in 1889–90 by Messrs. Johnson and Flad, and include that portion facing on Tower Grove Avenue (5–6) and running northward from Magnolia Avenue (A) to Shaw Avenue (Z). The principal points of interest are located as follows: —

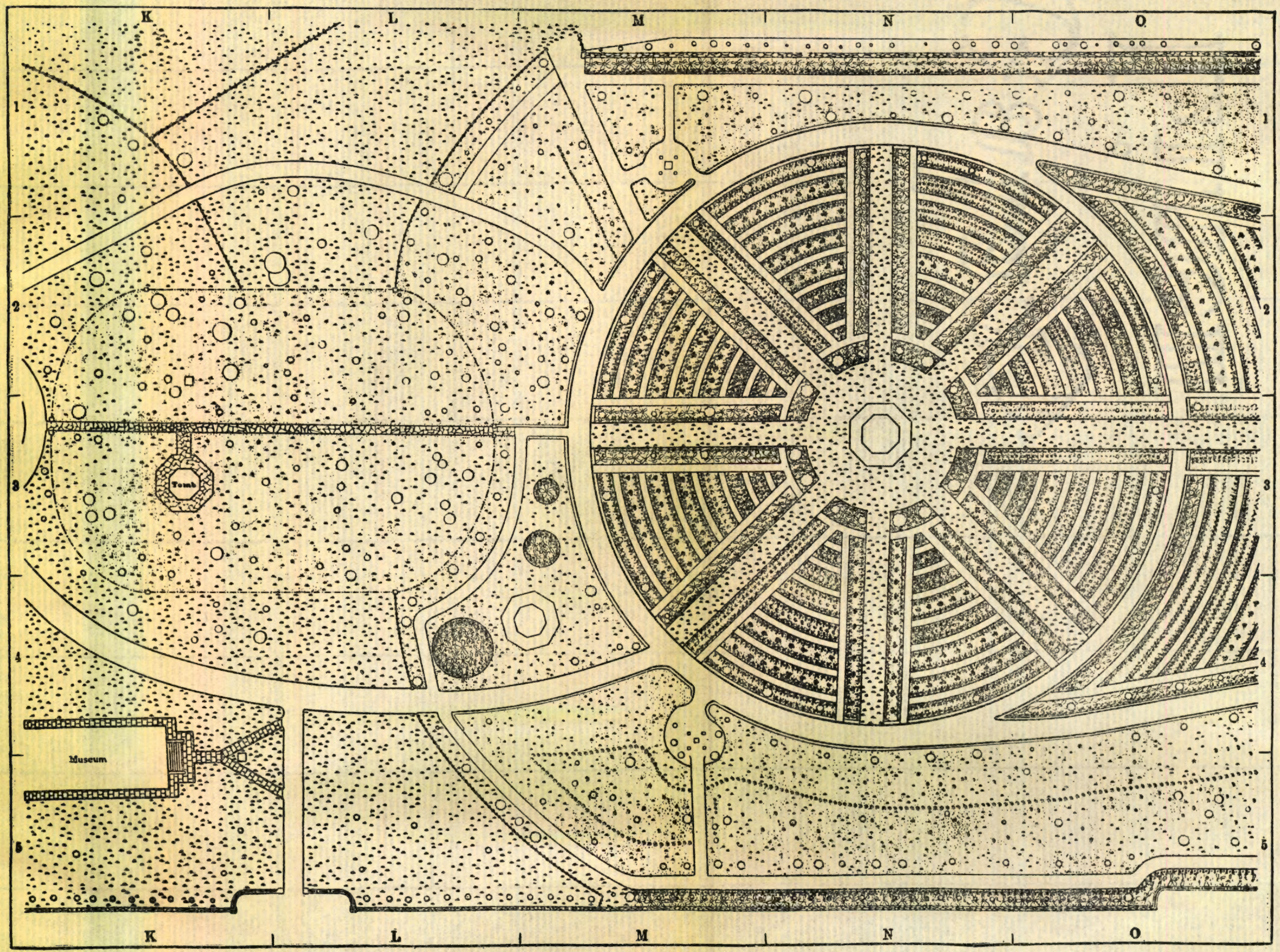
Arboretum Gates, M1, S1.
Director's Residence, I3.
Economic Plants, R1.
Entrance Gate, Q5.
Fruticetum Gate, U5.
Greenhouses, H–J3–4, R–T3.
Herbaceous Grounds, N3.
Library, K4–5.
Lily Ponds, Q–R4.
Lodge for Pupils, B5.
Museum, K4–5.
Parterre, Q3.
Pavilions, N3, W3.
Statue, Juno, Q2–3.
" Victory, M4.
Tomb of Henry Shaw, K3.
Vegetable Garden, H3.
Wells, I3–4, M4–5, U4.



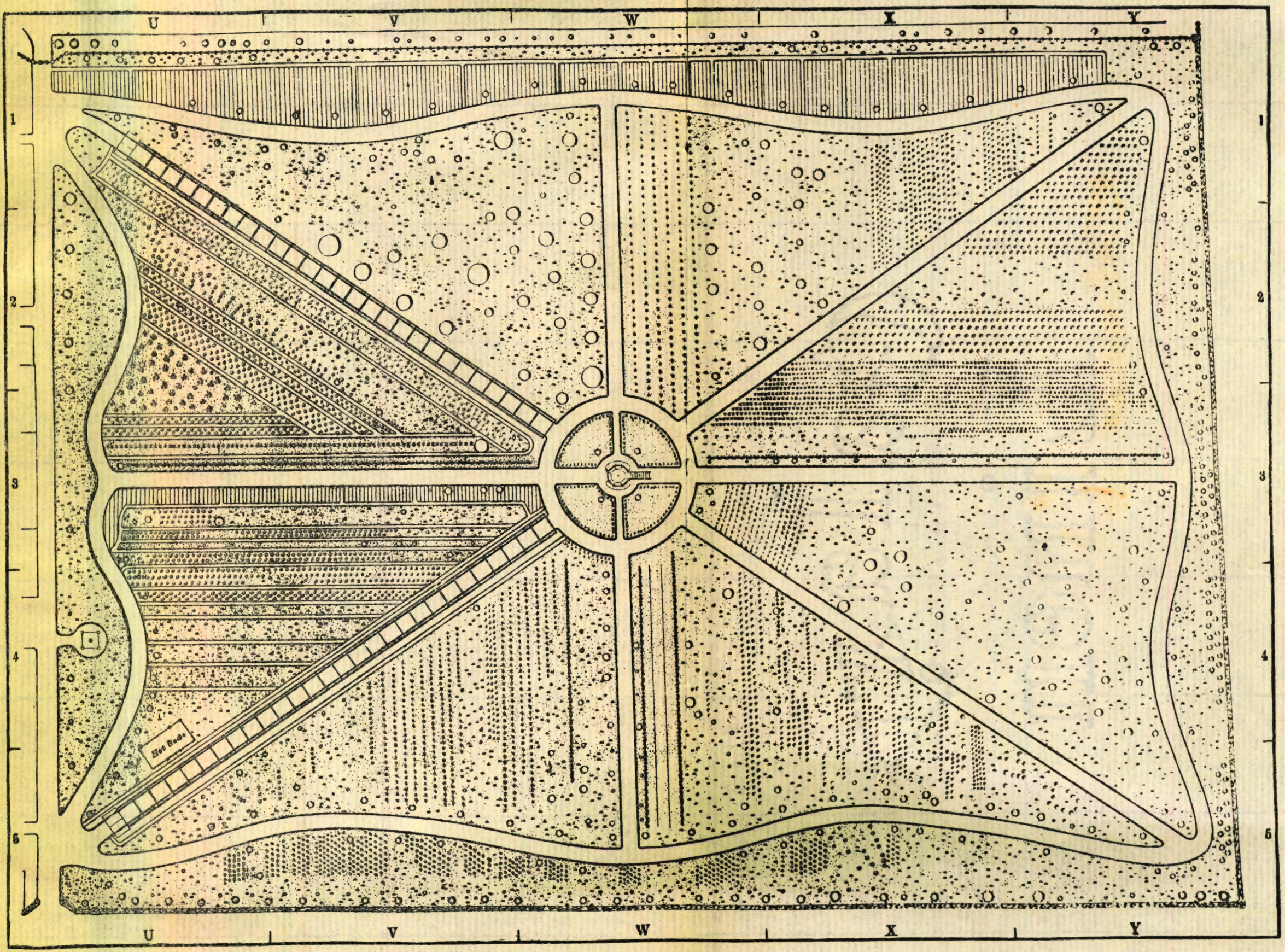
LODGE, AND MEADOW.



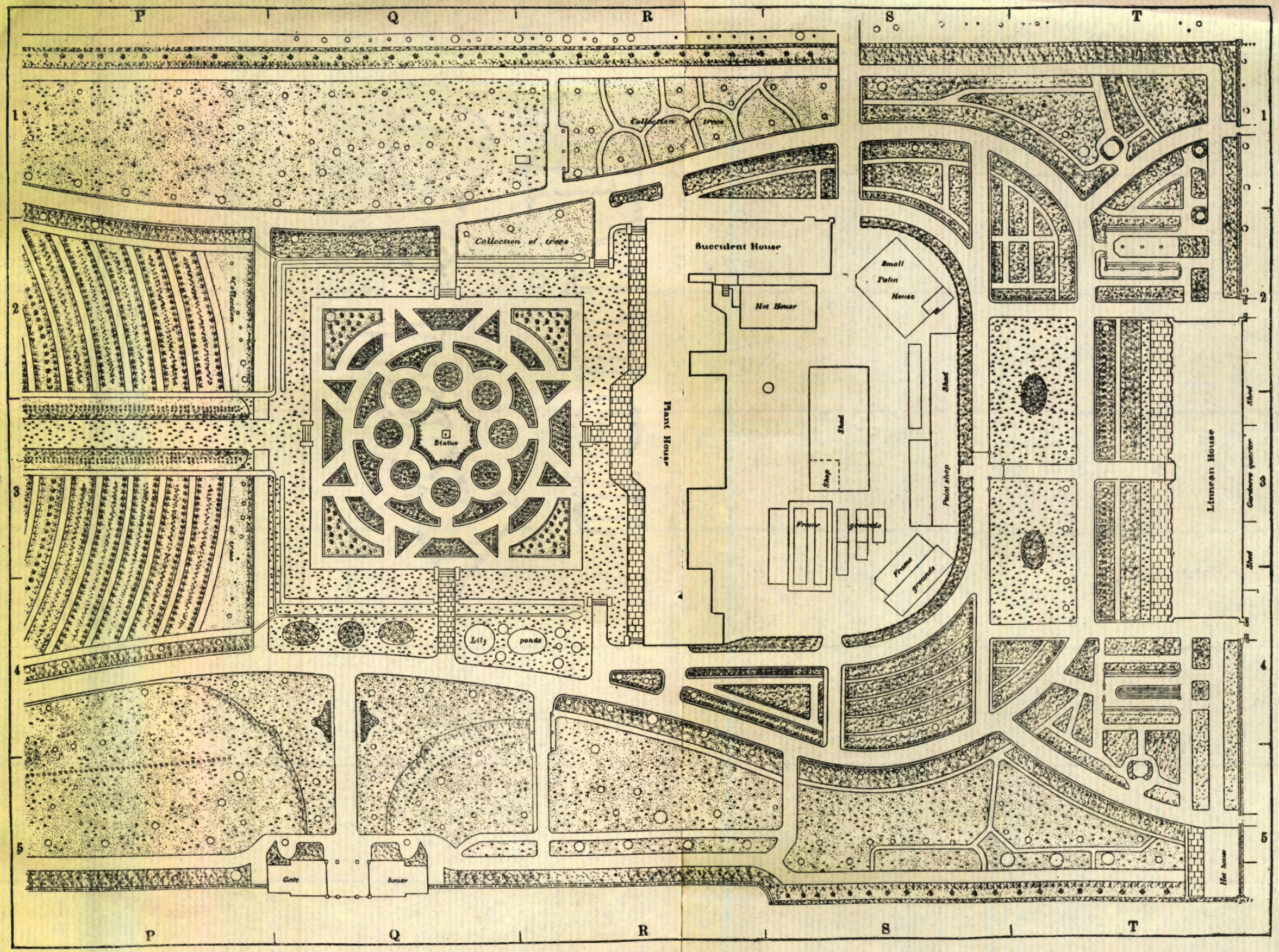
VEGETABLE GARDEN, AND LAWN.



GROVE, AND HERBACEOUS GROUNDS.



FRUTICETUM.



PARTERRE, AND GREENHOUSES.